Volume 94 Number 11

STEEL

Production • Processing • Distribution • Use

The Week in Perspective

REDUCTION of the work week to 36 hours, granting sovereignty to the national labor board, and revision of pricing methods are three burdens which industry is being asked to hoist upon its already weary back in the government's program to accelerate employment. Government loans and more public works are being offered in exchange. p. 10

A FAIR CHANCE at self-determination is all that industry asks, but present developments seem to indicate that this chance will not materialize. p. 22

QUANTITY DIFFERENTIALS on steel products are held contrary to principles enunciated in the national recovery act, this being the chief reason for their elimination in the steel code. p. 15

GOVERNMENT BUYING of structural shapes, reinforcing bars and pipe for three separate projects last week approached 10,000 tons. p. 47

ELECTRIC INDUCTION FURNACE installation pours small castings while power is on furnace, hot sprues and gates being recharged immediately. p. 40

STEELWORKS OPERATIONS have crossed the 50 per cent level for the first time since the week of Aug. 19, 1933. p. 14

FORGING PRESS exerting force of 15,000 tons, capable of handling 300-ton ingots, is being installed in Russia by a German builder. Higher than a ten-story building, the completed press will weigh a mere 3500 tons! p. 28

INDUSTRY AT THE CODE CONFERENCE: Withdrawal of open-price provisions will not stop price fixing where it now exists . . . . Open prices constitute a vital element in codes . . . . Use of long-term credits is essential to future of durable goods industry . . . . Encourage growth of service and luxury occupations . . . . Socialize surplus labor rather than saddle it further upon industry . . . . Rules of fair practice which are fundamentally right will not be a hindrance to opportunity. pp. 11, 12, 13

UTILITY STOCKHOLDERS propose to band together in a form of union to protect themselves against prevailing political tyranny. Ten million united votes could do much. p. 17

EXPORTS OF SCRAP fell off sharply in January; other iron and steel products showed a gain over December. Imports dropped to the lowest since a year ago. p. 18

AUTOMOBILE LABOR, aroused by mounting production schedules and coddled by union leaders, presented to employers a 7-point ultimatum of pay raises and shorter hours—or else. Promise of a hearing in Washington Wednesday calmed the situation temporarily. p. 19

INCLUSION OF STANDARDS clauses in NRA codes is being sought by the consumers' advisory board. p. 44

BLAST FURNACE TUYERE of a new design, featuring a refractory nose, is showing important savings in respect to long life. p. 31

ARC WELDED STEEL FABRICATION was used in recent construction of a 75-ton beet pulp dryer. p. 42

WIRE AND WIRE PRODUCTS take about 8 per cent of the country's steel production, a myriad of applications ranging all the way from heavy bridge cables to spider lines in instruments. History of wiremaking shows the material in use as far back as 1700 B.C. p. 25

TRUCKING OF 200-TON LOADS of pipe at Boulder dam called for new ideas in trailer design. Result: A 37 x 22-foot 16-wheel unit, pulled successfully over rough country with a load of 194 tons. p. 38

METALLURGICAL RESEARCH facilities of a Youngstown, O., steelmaker have been expanded. p. 30

Industry Seeks Offsets for Shorter Week, Higher Wages

WASHINGTON

REPRESENTATIVES of the capital goods industries, including steel, are expected to confer with government authorities early this week to try to effect some trade which will enable these industries to meet the government's demand for still shorter hours and higher wages for labor.

Loans to enable weak manufacturers to carry additional payroll burdens, public works calculated to stimulate the production of capital goods, some assurance to overcome the timidity of capital from flowing into these "key" industries—these were some of the forms of assistance sought in return for industry's voluntary cooperation.

The government is adamant in its stand that industry, chiefly the capital goods division of it, make a further contribution to the relief of unemployment. The swiftest and most direct approach, as the government views it, is for the President to issue an executive order, which may blanket the enforcement of codes as well as revise hours for industries operating 36 or more hours per week.

Following last week's NRA convention of code authorities, opened Monday by the President and closed Wednesday night by General Johnson, a committee of 12 representing the capital goods industries went into conference, planning to meet this week with the General. Out of last week's sessions came a three-point program, of which the first two planks were fully conceived before a single code authority arrived. The third still is open. This program is:

Reduction of the work week to not more than 36 hours, accompanied by increases in hourly wage rates sufficient to maintain current weekly earnings.

Granting sovereignty to the national labor board to make effective its interpretation of collective bargaining under section 7a of the recovery act.

Revision of pricing methods in codes, possibly elimination of open prices or a shortening of the waiting period, or creation of an impartial agency—perhaps the government—to receive open prices, or increased government representation on code authorities.

For iron and steel the specific effect of this three-point program would be:

Amendment of the steel code to curtail the work week from 40 hours to 36, with an 11 per cent increase in base wage rates.

Practically complete abandonment of employe representation plans and opening the door to unrestrained unionization.

Quoting iron and steel at the point of production, and if open prices receive a reprieve, a scaling-down of the present ten-day waiting period. Probably, also, representatives of the NRA consumers' advisory board sitting with the code authority—the American Iron and Steel institute.

Prompting this further pressure on industry the following reasons are being discussed, more or less openly, in Washington:

NRA has proved disappointing so far as returning men to work is concerned. Unemployment is estimated at 6,000,000 to 7,000,000 persons; termination of CWA will release some 4,000,000; it is up to indus-

THE PRESIDENT BARGAINS COLLECTIVELY WITH INDUSTRY: Scene at Constitution hall, Washington, last Monday when the President opened the three-day NRA code conference. Standing at the left of the President, who is in the center of the platform, are Gus Gennerich, his personal aide, General Johnson, Assistant Secretary of Labor Grady, Senators Wagner and Norris, with Donald R. Richberg, chief counsel for NRA, facing the camera. Seated at the right of the

try to tighten its belt and absorb more labor.

Labor is growing restive and a period of strikes is impending—believed by industry to have been fomented largely by the attitude of NRA. Only a shorter work week with no reduction in earnings plus absorption of more labor can avert a bad situation.

Congressional attacks upon NRA and its suspension of antitrust laws can be quelled only by further restrictions on open prices and pricing methods in general.

The President is being subjected to the increasing influence of radical advisers; the consumers' advisory board of NRA is rallying radicals and liberals to its cause; probably increased business this spring affords an excuse for saddling industry with more of the burden of recovery.

Industry should prefer to work out its salvation in regard to the work week, wage rates and collective bargaining under the flexible NRA rather than under mandate of congress, and that acquiescence in the NRA program will avert—for the time being, at least—passage of the Connery 30-hour bill, the Wagner bills providing an airtight labor board, compulsory unionization, and unemployment insurance, and other radical legislation.

Industry Dissents, So What?

To much of this reasoning industry dissents, of course, and it was not backward last week at various group meetings of code authorities in expressing itself, but that is the way Washington is thinking.

No observation won louder applause than that of a hardy soul who shot back at a division administrator, when the matter of shorter hours and higher wages was cited as a demand: "What are we going to use for money?"

And Robert Gaylord, speaking for the machine tool industry's code authority, delivered an alternative which evoked considerable approval when he said: "It is better to socialize the surplus of labor under some scheme like the CWA. Industry cannot carry the burden any longer."

Madame in Slight Error

Not only did steel last week come under the direct fire of General Johnson in regard to a 36-hour week but it also was enfiladed by Secretary of Labor Perkins, who declared that the industry would be expected to re-employ 300,000 additional persons, with 500,000 more to be absorbed by the machinery trade and 1,500,000 by the capital goods intries. From a subsequent remark it was evident that Miss Perkins was including hardware, tractor, machine tool and farm implement figures in iron and steel.

Responding for the industry, Walter S. Tower, executive secretary of the Iron and Steel institute, questioned whether Miss Perkins was not confusing iron and steel for the entire metalworking trades.

At the peak of 1929, according to Mr. Tower, iron and steel employment totaled approximately 420,000. At the low point of the depression, in 1932, employment ebbed to 210,000. Last June, employment had rebounded to 338,000, and in January, 1934, to 393,000.

Wage payments in January totaled $26,737,393 compared with $26,439,830 in December, when employment was 394,943.

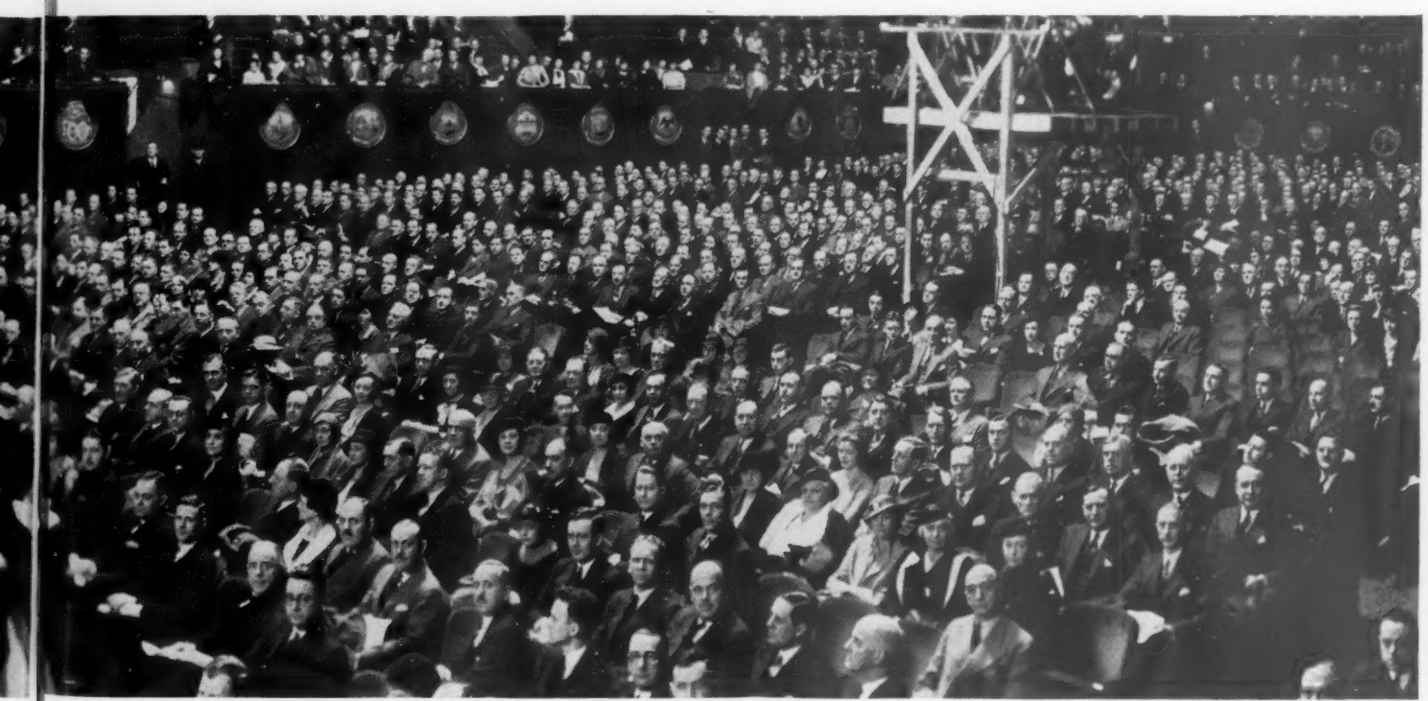
Average earnings per hour in January, according to Mr. Tower, were 58.3 cents, against 57.8 cents in December. Total payrolls, including salaries as well as wages, in the iron and steel industry in January were $34,877,542, against $34,323,694 in December.

Present steelmaking costs, upon which a 11 per cent direct increase in labor costs may be superimposed, plus the intangible further burden involved in spreading work, absorbing "green" personnel and shorter shifts, already show a pronounced lift over last spring, when recovery set in.

In June, 1933, when the output of finished rolled steel was 1,870,000 tons, payments to labor totaled $24,434,000 or $13 per ton. By November, when output was down to 1,110,000 tons, wage payments had risen to $24,838,000 or $22 per ton.

Price Boost the Answer?

From $13 to $22 per ton is an advance of 69 per cent. The direct rise in wage rates being 22½ per cent, the added burden of operation under NRA exclusive of labor was 36½ per cent. To put wages up 11



President in the front row are the chaplain of the senate, Secretary of State Hull, Secretary of the Treasury Morgenthau, Secretary of War Dern, Attorney General Cummings, Secretary of Commerce Roper, and Secretary of Labor Perkins. Directly behind Secretary Roper is Jesse Jones, head of RFC. There were 4000 NRA code authorities in Constitution hall to hear the address and an overflow audience of several hundred in the adjacent Memorial Continental hall

per cent would probably increase the cost of steel at the shipping dock even greater, with the fluctuation in production injecting a variable.

The estimate of one steel authority is that it would require an increase of more than $2 a ton in the selling cost of steel to requite producers for this further dislocation.

When more than 4000 NRA code authorities assembled last Monday to hear President Roosevelt formally open the NRA conference, it was the greatest assemblage of industrial executives in the history of the United States.

Some hundreds of code authorities, arriving in Washington with a degree of new importance, encountered their first disillusionment when they found no small proportion of seats in Constitution hall pre-empted by social Washington and NRA officials, compelling them to listen to the opening exercises through an amplifier in adjacent Memorial Continental hall. The tension was relieved somewhat when the President later made a personal appearance for the overflow audience.

Monday afternoon, immediately following the addresses by President Roosevelt and Donald R. Richberg, chief counsel for NRA, Secretary Perkins; Senator Wagner, chairman of the national labor board; Pierre S. duPont, Henry S. Dennison and R. E. Flanders, all representing the industrial advisory board; William H. Green, president of the American Federation of Labor; Dr. Leo Wolman, of the labor advisory board; and Mrs. Mary H. Rumsey and others of the consumers' board addressed delegates.

Industry's Voice a Whisper

Group sessions on trade practices, small industries, labor, code administration, and open prices followed on Monday night, Tuesday and Wednesday. In many respects the proceedings were similar to those of the week previous, when consumers had their innings. Except for the determination of a course on open prices, industry's voice on labor and code administration probably will be found of little effect.

At the outset of the conferences on open prices, assurance was given by Arthur D. Whiteside, division administrator, that NRA had an open mind.

The larger, fully integrated producers of iron and steel were represented only by Charles R. Hook, president of the American Rolling Mill Co., Middletown, O., and member of the steel code authority, and Mr. Tower, spokesman for the Iron and Steel institute. The fabricating and machine tool industries, however, were generously represented and their spokesmen were leaders of many of the sessions in which they participated.

Only when labor leaders and representatives of the labor advisory board mentioned steel was the industry maligned. No consumer raised his voice to object to the steel code and, in fact, the code was applauded by at least one consuming group.

Fair practice regulations encourage greater initiative, better quality of products and more efficient business procedure, Mr. Hook declared.

"Codes for the various industries, although they may still need some revision in certain cases because the rules were perhaps not fair to all, have made possible the elimination of many unfair practices that have grown up through the years," said Mr. Hook. "They have proved that, given the right and the opportunity to legally confer, the major factors that produce unfair competition can and will be eliminated.

Renew Hope for Future

"Considering the short time available for preparation, those codes which have been approved and are now effective are extremely creditable documents. They certainly have given a hope for the future and now point the way to a business regime which can and must be made satisfactory to all concerned.

"The final test of fair practice rules in business, after all, is the effect they have in encouraging and maintaining a general exchange of goods and services.

"The consumer is the keystone of our plan, and unless he is in a position to purchase the articles of production, the distributor and the producer will not be able to employ people, pay wages and make a reasonable profit for the owners of the business.

"This being the fact, it is necessary for producers and distributors to operate their businesses in a way that makes purchase and consumption possible on a large scale.

"Business is simply the exchange of goods and services and the exchange is general and permanent when the relationship between the financial reward for the various units of service, commodities and products is fair and sound. In no other way can there be employment on a basis that will permit of the maintenance or raising of our standard of living.

"It seems to be an American instinct to question any program which provides regulation of business activities. The reasons are no doubt due to the thought that regulations curtail initiative and opportunity.

"Rules of fair practice which are fundamentally right will not be a hindrance to individual or collective opportunity but will offer a greater field for the American spirit of independent constructive action."

Herman H. Lind, Cleveland, general manager, National Machine Tool Builders association, and member of the code authority for the machine tool and forging industry, made a spirited defense of open prices.

Referring to a paper prepared by him in 1932 covering competitive conditions and entitled "Buying Below Cost," he maintained that the plight, especially of small industries, a year ago reached the point of complete demoralization largely through unfair tactics of the recalcitrant 10 per cent, to curb which was the express purpose of the recovery act. Mr. Lind said in part:

"The suggestion has been made within the past few days that buyers group themselves together to get the advantages of group action. May I point out that the buyers today buying for large and concentrated industries, such as mail order houses, department stores, chain stores and some of the large manufacturing industries, do have that advantage in fact.

"It might not be such a bad idea for all these buyers, both the large and the small, to get together under a code of fair competition, and among other things, provide that it be construed as an unfair trade practice to divulge, or even to intimate to any supplier the prices, terms and conditions offered to him by that supplier's competitor or competitors. They might also use the code to outlaw the pirating of engineering or style designs, or assisting others to pirate such designs.

"The act was written and passed with the clear intent of enabling industries to work together in an effort to bring back fair wages, fair working conditions, fair trade practices, and prices under which industry might live. Published open prices are a means to that end.

Getting Away from Chiseling

"With the provision that there shall be no deviation from those prices, all customers will be treated fairly and without discrimination. Every buyer will know that no one else is buying from a given producer at a better price; consequently his effort will be directed to determining the real value of the product in proportion to the price offered him, instead of a chiseling operation between hungry competitors.

"In all these discussions, consumer goods have received much emphasis. Let us consider for a moment durable goods, such as machinery and all sorts of equipment, where individual manufacturers determine and establish their own prices by listing them with their code authority, their trade and their competitors.

"Through this method, if a manufacturer sets his price too high, he loses business; if he sets it too low, he loses money. If he has reason to increase or to decrease his price, sufficient length of time should be given his trade and his competitors to know that a change will be made; also, that the price change is a matter of policy, and not a matter of temporary expediency for some immediate advantage.

"An insufficient period for notice of price change for this type of equipment, in my opinion, would

wreck the firm policy which is so necessary to the continued life of these industries, and would put them right back where they were a year ago, forced to make lower and lower prices in order to meet progressive price cutting.

"It would give a few powerful buyers who proved to be the best traders a more favorable price than others could obtain. It would not be surprising, then, if the seller, when he felt he had an inside track in certain cases, would raise his price for a specific order, and then drop it back again, to the disadvantage of a given customer.

"The firm price policy should also mean an open price policy. The open price policy can be effective in maintaining firm prices only by providing such time for notice of change in price as to eliminate the use of instant change of price as a subterfuge for price cutting.

Prosecute Illegal Cases

"It has been claimed that the open publishing of prices is resulting in unfair and illegal price fixing in some industries. If this is true, there are in existence protective laws which provide plenty of power to investigate and prosecute the wrongdoers. The withdrawal of open price provisions, or the elimination of the period of notice of change of prices, will not stop price fixing where it now exists."

Frank A. Bond, vice president, the McKay Co., Pittsburgh, and secretary of the code authority of the chain industry, also entered a strong defense of open prices and evidenced so wide a knowledge of the situation that he was called upon by Administrators Whiteside and Harriman to develop the open price situation for other industries.

Open prices, Mr. Bond maintained, constitute the vital element of codes, and should these price provisions be withdrawn codes would be destroyed. Also, a waiting period is necessary in order to curb chiselers.

Granting that open prices might lead to uniform prices, Mr. Bond insisted that uniform prices were inevitable anyway. Prices would either be on the destructive level determined by the most vicious chiseler or could be placed through codes on a level remunerative to the producer and fair to the consumer.

Scouts Defamatory Charges

"It is the right of industry to get back its cost and a little extra," he insisted. "I strongly resent the imputation that there is no honesty in code authorities. We don't need any impartial or government agency to administer our code. We ask only an appeal to a higher authority if we fail to justify the trust imposed in us."

"We are willing to have the producers of raw materials, including steel, apply open prices principles in their relations to us."

In response to questioning by Administrator Harriman, Mr. Bond expressed willingness of his industry to suspend open prices if complaints were lodged, and a fair preliminary investigation were made.

The inference of improper price fixing, which Mr. Bond resented, had been made by Dr. Dexter Keezer and other members of the consumers' board. As expressed by Doctor Keezer, open prices and waiting periods are open to grave suspicion, the consumers' board "prefers to clean up the open price situation to scuttling it" and "uniform prices suggest an unreasonable degree of intimacy among members of an industry."

The matter of uniform prices being quoted to federal, state and municipal purchasing authorities was pursued deeply by Administrators Whiteside and Harriman, and manufacturers were warned that some modification is inevitable. Typical of the attitude of manufacturers was the observation of Mr. Bond that "states and municipalities are entitled to a little sympathy from suppliers." Code authorities were almost unanimous in expressing the opinion that federal, state and municipal purchasing agents have been hard buyers.

Generally, open prices were supported by manufacturers and condemned by retailers, the latter having the support of the NRA consumers' board. It is evident that some serious modification, if not the total elimination of open prices, is at hand.

Examine Wage Differentials

At the numerous sessions devoted to labor, not only were hours and wages discussed, but also differentials between the North and South, collective bargaining and the necessity for stimulating the capital goods industries—the latter figuring prominently in the week-end conferences relative to shorter hours and higher wages.

James W. Hook, president, Geometric Tool Co., New Haven, Conn., submitted a masterly analysis of differentials in pay as between North and South, male and female workers, large cities and urban communities, etc.

He also dwelt extensively on the general effects of mechanization of industry, the causes and results of such mechanization. He regarded the arbitrarily fixed working week as the most sinister feature of NRA, in that it invites collusion between employers and employes, and dangerous because it involves one of those personal rights that will not yield to objective penalties.

John W. O'Leary, president, Machinery and Allied Products institute, emphasized the importance of encouraging sales of durable goods, saying there can be no large and lasting recovery in employment until there has been a substantial improvement in the durable goods industry. He recommended that there be no further reduction in hours in the durable goods industry, and he emphasized the necessity of enabling durable goods manufacturers to make a reasonable profit.

R. E. Flanders, president, Jones

ARCH FOE OF CHISELERS: Frank A. Bond, vice president, the McKay Co., Pittsburgh, and secretary of the code authority of the chain industry appearing at the trade practices session of the NRA conference in Washington last Tuesday. An advocate of open prices and of a waiting period, Mr. Bond also strongly resented the imputation that there is no honesty in code administration. Mr. Bond is at the right in the illustration. At the left is W. A. Harriman, an NRA division administrator, while in the center is Arthur D. Whiteside, also a division administrator

& Lamson Machine Co., Springfield, Vt., who as previously noted, addressed the Monday afternoon session as a member of the NRA industrial advisory board, declared that "as a result of spreading work during the depression the project of shorter hours has something to be said for it, but as a result of recovery it is not merely ineffective—it is destructive."

Frank R. Hoadley, Farrel-Birmingham Co., Ansonia, Conn., member of the gray iron code authority, protested the proposal to reduce hours of labor further.

R. R. Fauntleroy, Moline Malleable Iron Co., St. Charles, Ill., and member of the malleable code authority, also stressed the shortage of molders and other skilled workers, and said that the malleable industry with its reserves depleted, could not stand a reduction of hours.

When Col. George Brady, deputy administrator, suggested that since there is a shortage of some skilled and semi-skilled workers these classes be permitted to work up to 60 hours a week in the periods of peak demand. This met with general approval, but this approval was diluted when he added further that time and one-half be paid for all such employment over 40 hours per week.

Sam Traylor, Traylor Engineering & Mfg. Co., Allentown Pa. delivered a forceful protest against this suggestion saying that after operating two years at 10 per cent of capacity, his company has just booked business at prices covering the bare cost of production and that higher wages would be ruinous.

Discouraging Buyers

Robert Gaylord, president, Ingersoll Milling Machine Co., Rockford, Ill., and previously noted as preferring socialization of the surplus of labor to saddling it further upon industry, referred to the shortage of skilled men in the machine tool industry, and warned that a consequent increase in the selling price of tools would discourage buyers "who normally lead the way back in the bleak dawn of recovery."

George B. Durell, president, American Fork & Hoe Co., Cleveland, chairman of the code committee of the general tool and implement industry, pointed to excess capacity, some axe manufacturers having triple the facilities required, and insisted that any addition to existing facilities for production in the implement industry would be an economic waste.

In a letter to the American Iron and Steel institute and the code conference, Walter B. Richards, president, Richards & Conover Hardware Co., Kansas City, Mo., protested the freight clause as well as the one-half of 1 per cent cash discount, the former because it enables producers of steel to dictate the routes and means of transportation, and the latter because it eliminates the 2 per cent discount that has been a part of the hardware business for over 75 years.

Production

STEELMAKING operations last week increased 3 points to 51 per cent, crossing the 50 per cent rate for the first time since the week of Aug. 19. If advanced schedules are maintained, this week will supply a further increase.

Gains were reported last week in the Chicago, Pittsburgh, Youngstown, eastern Pennsylvania, Detroit, Cleveland and New England districts. Birmingham and Buffalo were stationary, while Wheeling was off slightly.

STEEL's weekly estimates of steelmaking operations for February, after adjustments for fractional weeks, averaged 42.75 per cent, identical with the weekly forecasts of the American Iron and Steel institute. The official operating figure for the industry in February, based upon actual production reported to the institute, was 42.78 per cent.

Pittsburgh: Although ingot operations last week ranged from 25 to 60 per cent in plants of individual producers, the average advanced 3 points to 34 per cent for the district. Rate of a leading producer at just over 40 per cent has been a chief cause in sustaining this advance. Rolling of rails by Carnegie Steel Co. possibly this week should help to increase the district rate to 35 or 36 per cent.

An additional steelworks blast furnace has been lighted here, making 19 out of 60 stacks in blast. Blowing in of a third stack at Bethlehem's Johnstown, Pa., works was the only net change of the week.

Youngstown: Advanced 4 points to 56 per cent last week, with a further increase to 57 per cent expected this week. Fifty-one out of 83 open hearths are melting, and an idle bessemer furnace will be started shortly.

Central Alloy division of Republic is operating at the highest rate since early 1930. American Steel Foundries has placed its Alliance, O., works on a 4-day week, best in months, with 600 men employed. Timken Steel & Tube Co., Canton, O., is at 80 per cent.

Chicago: Rose 6 points to 50 per cent, highest rate since last August. Addition of a Gary blast furnace gives the district 11 active steelworks stacks out of 36. Better railroad demand largely is responsible for the latest rise, with further gains predicted for this month.

Cleveland: Up 3 points to 82 per cent, Otis Steel Co. lighting its eighth large open hearth, recently repaired, and continuing with four small units at its Lakeside plant; Corrigan, McKinney Steel Co. with 13; and National Tube Co., Lorain, 11. These also are the schedules for this week.

Wheeling: A decline of 7 points to 70 per cent was recorded as the average of ingot operations in four district plants last week when 27 out of 39 open hearths in the district were making steel. The 70 per cent rate is expected to continue this week. Wheeling Steel Corp. expects to blow in two blast furnaces this week, one at Portsmouth, O., and the other at Steubenville, O.

Birmingham: Additional railroad business is sustaining the 52 per cent steel ingot rate here.

Buffalo: Steady at a fraction above 52 per cent. There are 20 open hearths in production here, with others being made ready. The next major upturn will probably depend upon releases of rail tonnage. No material reduction in ingot output is

Sees Reassuring Capital as Best Govt. Business Aid

GEORGE HOUSTON, president, Baldwin Locomotive Works, and speaking for the Machinery and Allied Products institute, stated that the heavy industries have carried the bulk of the financial load during the depression.

"A great many of us would have been better off financially if we had shut down at the end of 1931 *and put our plants in the hands of custodians," said Mr. Houston.*

"The heavy industries cannot exist unless there is a flow of capital into business. In 1933 *only* $138,000,000 *of new capital went into private enterprises. Normally four or five billion dollars a year went into private enterprise. We are now down to* 3 *per cent of the* 6*-years' average. We cannot increase costs in the face of this situation. We must restore the flow of savings into enterprise.*

"The President stated, in his splendid speech Monday, that he wanted constructive suggestions and I suggest that the government reopen the capital markets. One of the most important obstructions is the securities act of 1933. *The stock exchange regulation bill now before congress would prevent the marketing and distribution of our securities.*

"The heavy industries must sell to the farmer and to the producers of raw materials. Let us strive to regain the proper balance between agriculture, the products of raw materials, the products of other companies with whom we compete, and with the opening of the securities markets, there will be no question of unemployment in the heavy industries."

expected by producers here during the next few weeks and probably not until after June 1.

Central eastern seaboard: Up 1 point to 31 per cent. Although the number of open hearths on is unchanged, some schedules have been lengthened. Increasing releases from the railroads and slightly better miscellaneous demand indicate further improvement.

Detroit: With Ford now operating seven open-hearth furnaces, 15 of the 18 in this district are operating, lifting the steelmaking rate to 93 per cent. At least one more Ford furnace is being prepared for operation.

New England: Up 1 point to 66 per cent last week, with little change indicated for this week. One important works is now operating at 40 per cent and another at 90.

¶American Iron and Steel institute official statistics on February open-hearth and bessemer steel ingot production place the total at 2,224,698 tons, or 92,696 tons a day. In January, only 1,996,897 tons were made, averaging 73,959 tons daily. In two months, steel ingot production thus totals 4,221,595 tons, or almost double the 2,116,942 tons of the same period of 1933. February operations averaged 42.78 per cent.

New Capacity

MITSUI & CO., 350 Fifth avenue, New York, has placed an order for 12 tin plate mills—six hot and six cold—with the United Engineering & Foundry Co., Pittsburgh. They are for installation in Japan.

¶Soaking pit equipment at the South works of the American Steel & Wire Co., Worcester, Mass., including six 1-hole producer-gas fired pits, will be replaced with new stripping and loading cranes and eight new pits each having a holding capacity of six 3-ton ingots. An all-steel building, 189 x 103 x 85 feet, will house the new equipment. The pits, contracts for which have been awarded, will be installed in line to facilitate charging.

Institute

AMERICAN Iron and Steel institute reports the following price filings with their effective dates:

Low phosphorus pig iron, $19 at Johnson City, Tenn., March 17.

Hot-rolled strip, 1.85c, at Chicago, March 17.

Wire nails $2.65, Houston and Galveston, Tex., March 15.

Low carbon spring wire, 2.65c at Pacific coast ports, March 5.

Annealed stone wire, 4.20c, and galvanized stone wire, 5.20c, at Pittsburgh, March 3.

Stapling wire in 8-inch coils, 3.85c at Chicago, and 4.45c, at Pacific coast ports, March 2.

Galvanized sheet rejects known sizes, and galvanized sheet wasters random sizes No. 10 gage and heavier, 1.40c, Pittsburgh, and 1.50c, Gary, March 11.

Washington

FEDERAL trade commission late last week began consideration of the report of its chief counsel, Judge Robert E. Healy, on the Borah resolution seeking information on the operation of the price provisions of the steel code. The report, it is expected, will be adverse to basing points, and recommend that iron and steel be quoted at the point of production.

¶NRA consumers' advisory board last week in a report to General Johnson attacked basing points, zone freight systems and other marketing methods. Steel was mentioned specifically in the suggestion of the consumers' board which says in part:

"While we are not prepared to deny that such devices may be needed and used fairly in some industrial situations, their history is one of grave abuse. There is abundant evidence to show that in the past such systems have been used to load upon the consumer charges for imaginary freight, and to confront him with a

(*Please turn to Page* 46)

Gives Stand on Quantity Discounts

WALTER S. TOWER, who is executive secretary of the American Iron and Steel institute, New York, presented the official attitude of the iron and steel industry in regard to quantity differentials or discounts at the NRA code conference last week. It is that such differentials or discounts would be incompatibile with the national industrial recovery act and would discriminate against small buyers. Mr. Tower's full statement follows:

The question of quantity differentials or quantity discounts, whichever way you may choose to speak of the subject, is a matter which, in the drafting of the steel code, was discussed at considerable length. Prior to the drafting of the code, there had been many variable practices in the steel industry with respect to the pricing of different products for different purchasers.

Generally speaking, I believe it was thought that the large purchaser could get a different price from that which was quoted to the small purchaser. It probably is equally true that the purchaser of a given quantity did not always get the same price as another purchaser of a like quantity. I mean by that statement that there probably was not any uniform classification, such as has been practiced, as I believe, in some industries in respect to the purchasers having a grant of quantity differentials or discounts.

You are probably all familiar with the fact that in respect to differentials of this sort the procedure in one industry may be to grant differentials on what might be called the functional basis. I mean that a jobber may receive one discount or differential, and a wholesaler—if you distinguish between a jobber and a wholesaler—a second grade discount or differential, and a dealer, a retail dealer, still a different discount.

The other system which has been relatively common, I believe, is that of basing discounts entirely on quantities in either one of two ways—either the quantity purchased at a given time or the quantity purchased over a period of time, the period of time varying widely.

So far as I am familiar with the situation in the steel industry, neither one of those policies has been followed either consistently or regularly. There have been at times combinations of both of them, but neither one could have been said to have been uniformly characteristic of the steel industry.

Contrary to NIRA

The question of differentials and discounts was discussed very extensively at the time the code was being framed, and the general conclusion reached by members of the industry who were active in discussing the various provisions which were to go into the code was to the effect that there should not be quantity discounts or differentials. The chief reason for that appears to have been the provision in the national recovery act, in Section 3a, I believe, to the effect that codes are not to be designed to promote monopolies or to eliminate or to oppress small enterprises.

I believe also this question of differentials and discounts in connection with that provision of the recovery act was discussed informally with representatives of the national recovery administration and with the idea of granting or providing for no quantity differentials or discounts in the steel code meets with the approval—unofficial, perhaps—of those representatives of the recovery administration with whom the subject was discussed.

If you go back, you will find a relatively early presentation of this same idea, which, I believe, was behind the provision of the recovery act to which I have referred in the discussions which surrounded Section 2 of the Clayton act at the time it was before the congress about 20 years ago.

You may recall that in Section 2 of the Clayton act there is a provision which permits price discrimination in respect to grade, quality or quantity. The first two words, of course, are meaningless, because a price discrimination in respect to grade or quality is nothing more than the

equivalent of permitting you to charge more or less for something which costs more or less, as the case may be, and, therefore, the only point there is in that proviso of Section 2 of the Clayton act that has real meaning is that relating to discrimination because of quantity.

That particular word in the proviso to which I have referred was discussed at considerable length in connection with the debates on the Clayton act, and one might read into those debates a desire on the part of congress to eliminate by this legislation all such price discrimination; but in the final passage of the act, as you know, elimination of such price discrimination was not embodied in the recovery act, in the provisions to which I have referred, under Section 3a, the desire, if not the intent, of the congress appears to have been running in much the same channel, and that also is indicated, I believe, by referring to the discussion of parts of the recovery act before it was finally enacted.

It is not quite so clear, however, in the latter case as it was in the early case in connection with the debates, perhaps because the time in which the act was under discussion was very much shorter than it was in the case of the Clayton act.

However, if you take your text from the proviso which I have quoted to you, that the code shall not be designed to promote monopolies or to eliminate or oppress small enterprises, I think you will find there, at least by construction or interpretation, your guide to the elimination of quantity discounts or quantity differentials as entirely justifiable in the purpose of the legislation.

Now, as applied to the steel code particularly, I want to remind you of the fact that the steel industry is a quantity production industry. It is a tonnage proposition. It does not sell very much of its product or very much of its volume to what may be called the retail consumer. It is an industry surrounded with producer goods rather than with consumer goods, using "consumer" in the sense of retail consumer. For that reason, the price conditions of the steel code or the steel industry may not be of very much interest to many, if any, of those of you here.

Hold to Open Price Policy

I would like, however, to indicate to you in a little detail how the situation works out in respect to the steel code and the matter of quantity differentials or discounts. I may have led you to believe from what I have previously said that there is no recognition of quantity differentials or quantity discounts in the steel code. That may or may not be strictly true, but I think the safest way to interpret what I shall presently say is that the steel code does not provide any quantity discounts in any way whatsoever.

The basic principle of the steel code in reference to prices is the open price policy. Every member of the code must file a price for each product covered by the code which such member produces. Those prices may be expressed either in cents per pound or dollars per ton, or with respect to some unit of measurement; but, generally speaking, the prices quoted are the prices filed by the members of the steel code and apply by implication, to quantities in carload lots, that being the unit of sale which has been customary in the steel industry for a long time.

If, in filing a list of base prices for products as required by the steel code, the member of the code indicates in such price filing that a discount or a price differential may be allowed on any product to a jobber, then a deviation from the price as filed for other classes of purchases may be allowed to such purchasers as can qualify under the rules or regulations with respect to sales to jobbers.

Functional Differential

The differential, therefore, is not a quantity differential in the sense you are talking to that subject here this morning, but is a functional differential separate from the question of quantity, because the large jobber gets the same differential as the smaller jobber.

It is not a differential that is based on quantity, but on function, and that deviation or exception to the one price to all classes of purchasers was written into the steel code because of the recognition on the part of the members of the industry who were concerned in the drafting of the code that for many members of the industry, the jobber or the jobbing trade represents an important part of the system of distributing steel products to the ultimate consumers thereof, and it was solely because of that recognition of the functional part played by jobbers in the distribution of steel products or certain classes of steel products in an important way that there was any deviation whatsoever in the steel code from the idea of one price, without classes of purchasers, irrespective of the quantity which they buy. I say irrespective of the quantity which they buy, and I speak in terms of carload units.

There are, in respect to certain products, amounts to be added, so-called quantity extras added for very small lots purchased. That I should refer to, although it is not in the nature of a quantity discount, in order to make it perfectly clear to you precisely how the system operates under the steel code.

It is not invariably true that less than carload quantities have a different price from carload quantities, but in respect to some price, very small fractions of a carload lot do pay an extra for reasons which are well founded in the practices of the industry and the conditions under which the industry must operate.

I think that it is the belief of the members of the steel code that granting a price differential to the large purchaser can fairly be construed as unfair competition in respect to the purchases of steel products, or creating conditions of unfair competition among purchasers of steel products.

The large scale producer, using steel as a material for manufacturing purposes or processing into finished products, is supposed in theory at least to have an advantage in the scale of his operations, an advantage apart from any which may have accrued to him in the past because of his ability to buy cheaper. If that is true, the large scale producer does not need, in addition, a better price in order to live.

If the large producer has a better price than the small purchaser, the small purchaser starts out with a handicap in competition, which must in the long run tend to work to the disadvantage of the small purchaser and to the advantage of the large purchaser.

The stimulative effect in the one case, to make the large purchaser still larger, and the small purchaser still smaller, means that allowing the system to run its natural course would ordinarily tend to eliminate the small purchaser and to perpetuate the large purchaser.

Now, if the recovery act really means that the codes shall not be designed to promote monopolies or to eliminate or oppress small enterprises, it would seem that if that line of reasoning is sound, that the system of quantity differentials or quantity discounts is not compatible with the provisions of the law.

I would like to call your attention there to the fact that the government itself long since set an example with reference to no quantity differentials or quantity discounts, and that is with respect to the one price for postage. A person who ships one package by parcel post pays the same rate as the shipper of thousands of packages by parcel post.

In connection with railroad freight rates, if you purchase the service of transportation from the railroad, and you are a purchaser, when you ship by railroad you pay the same rate if you ship one carload as if you ship 1000 or 100,000, and the government has set up one of its most important and independent agencies to see that that principle is religiously adhered to at all times.

Few Complaints Heard

In these elements of background of what we may call legislative thought on the question of quantity differentials or discounts, we believe we find full justification if not necessity for eliminating quantity differential or discounts under the steel code. So far in the administration of the steel code, and it has been in operation since Aug. 19, 1933, we have had relatively few criticisms from purchasers in respect to the matter of quantity differentials.

The general tendency, or the general attitude among purchasers, appears to be that if they struggle as small purchasers, they can be sure that the price of their materials is as good as the price of material which is being bought by their competitors, and they as users of steel are perfectly willing to take their chances in holding their place in the market or in the industry in which they are doing business.

WINDOWS OF WASHINGTON

Labor Firm in the Saddle

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Stockholders To Join Union

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Housing Agency Vindicated

WASHINGTON

LABOR scored all the victories won at Washington last week. Cracking down on the so-called "company union," Gen. Hugh S. Johnson gave the conference of NRA code authorities a broad hint of the motives actuating the administration.

"We know something about what is coming in this country—the worst epidemic of strikes in our history," said the general. He warned employers having company unions to call in Senator Robert S. Wagner's national labor board before congress acts. He added that sentiment for the Blue Eagle would be revived under specific orders from the President, and that NRA is reorganizing to enforce the penal sections of the recovery act, concluding this point in the vernacular, "You ain't seen nothin' yet."

Senator Wagner's bill, in brief, would create a permanent national labor board, empowered to settle labor disputes by arbitration, with abolition of company unions and recognition of majority representatives of labor unions in collective bargaining.

"The greatest obstacles to collective bargaining are employer-dominated unions, which have multiplied with amazing rapidity since the enactment of the recovery act," said Senator Wagner in introducing the new bill. "Such a union makes a sham of equal bargaining power by restricting employe co-operation to a single employer-unit at a time when business men are allowed to band together in large groups.

It deprives workers of the wider co-operation which is necessary, not only to uphold their own end of the labor bargain, but to stabilize and standardize wage levels, to cope with the sweat shop and the exploiter and to exercise their proper voice in economic affairs."

Following several increments of power recently, Senator Wagner's labor board, by executive order of the President, now is an independent body. The President's order deprived NRA's national compliance board of the power to review the findings of the labor board. It is expected the compliance board eventually will be used to enforce the recommendations and findings of the labor board. In any event, the labor board now has the power to obtain prompt enforcements of its decisions. The labor board's membership has been increased to 13, of which six represent industry and six employes, with Senator Wagner continuing as chairman.

The process of closing in on employers also was reflected when the house labor committee unanimously reported out the Connery 30-hour week bill. This bill limits the work week to 30 hours without reduction of pay, but has an amendment providing for an emergency executive board with power to allow any industry to operate on a 40-hour week for not more than three months in any one year. The bill provides that labor shall have equal representation with employers on all code authorities. This bill does not have the support of President Roosevelt, General Johnson, Miss Perkins and other administration leaders and hence is not regarded as likely to become a law.

Added to the voices of those cracking down on employers was that of NRA Compliance Director Davis, who specifically alluded to the steel and automobile industries as violators of the collective bargaining provision of the recovery act.

He said: "A great many printed plans of employe representation in the steel and automobile industries contain provisions which are continuing violations of the spirit of Section 7a. An example of such a provision commonly found in these plans is that there shall be no change in the self-organization of the workers without the approval of the plant managers. We regard that as continuing interference with self-organization." Mr. Davis proposed to treat this matter by mass action, that is, take it up through code authorities with all the industries involved.

WASHINGTON more and more has become the capitol of the nation in more ways than one. On March 14, the national labor board will hold a hearing here of employers and employes involved in the Michigan automobile strike scheduled for March 7, but postponed at the intervention of the labor board (see also p. 19).

In view of the strong advance on the labor front, it is interesting to note that a large group of investors is being organized for the purpose, in brief, of saving the nest-eggs of these investors.

American Federation of Utility Investors Inc., 203 North Wabash avenue, Chicago, is seeking to enroll some 10,000,000 utility security owners at $1 a head. The intention is to protect such investors against the prevailing political attitude, and to bring the case of such investors before the court of American opinion. It is felt here that this body is likely to accomplish results not possible in any other way, because the wishes of large numbers of voters are held in great respect here.

This recalls a plan placed under way last fall to organize a similar body among steel company security holders. Nothing so far has come of this plan. It is clear that in failing to organize such a body, the steel industry is ignoring one of its strongest potential defensive weapons, for a body composed of nearly a million steel investors would receive an ear in Washington, and at least be on a

parity with the worker and the farmer in striving to protect its rights.

ATTORNEY GENERAL CUMMINGS upholds legality of Federal Emergency Housing Corp., ruling that it may proceed with its proposals and contracts without prior approval by Comptroller General McCarl.

In effect, the attorney general held that the recovery act authorized the President to create corporate agencies to carry out the purposes of the act, that he was authorized to create such a corporate agency under state laws, that the corporation may acquire and convey real estate in its own name, and that Secretary Ickes or his corporation may secure land options without sanction of the attorney general. Thus the way is cleared for federal housing programs on a large scale requiring considerable steel.

Another government housing program now is under way. Mr. Ickes, in his capacity as PWA administrator, has signed a contract for the erection of 50 one-story houses for working men and their families at Altavista, Va. Each will have four rooms and bath with hot water tank.

Forty of the houses will cost $1312 each and 10 will cost $1880. The cost per room to the tenants will be $4 a month. Actual cost of constructing the entire group of buildings will be $45,000. The houses will be of frame. Up to date steel or part-steel houses have not gotten beyond the talking stage.

Exaggerated reports have been circulated here to the effect that, owing to the bad financial condition of many railroads with the result they are not considered good risks for the loan of PWA money, only about 50 per cent of the rails and equipment orginally slated for purchase actually would be closed. It appears at this time that only about 25 per cent of the original program still is in doubt; the remainder is expected to be placed shortly.

ORIGIN OF JANUARY IMPORTS

Gross Tons

	Pig Iron	Manganese ore	Ferromanganese
Netherlands	6,681	.....	.....
Canada	1,055	426	742
British India	4,150	648	.....
Soviet Russia in Europe	.....	798	.....
Brazil	.....	1,077	.....
Gold Coast	.....	4,207	.....
Norway	.....	.....	560
United Kingdom	.....	.....	80
Italy	.....	.....	31
Total	11,886	7,156	1,413

	Sheets, skelp and sawplates	Structural shapes	Steel bars	Hoops and bands
United Kingdom	2	.....	33	34
Belgium	459	820	620	654
Germany	24	209	107	82
Sweden	3	.....	260	7
France	.....	1	.....	46
Canada	.....	.....	2	.....
Austria	.....	.....	9	.....
Czechoslovakia	.....	.....	2	.....
Total	488	1,030	1,033	823

Scrap Exports Off; Other Lines Gain

ALTHOUGH exports of steel and iron products in January showed a decline from December, as reported in STEEL, March 5, p. 13, this was due to a great falling off in shipments of scrap. As a matter of fact, with scrap exports excluded, exports of steel and iron products in December were 83,602 gross tons and in January 90,751 tons, a gain of 7149 tons, according to the iron and steel division, department of commerce.

In 31 of the 61 classifications reported by the bureau of foreign and domestic commerce an increase was shown over December. The largest of these was in steel rails over 50 pounds to the yard, 5208 tons. Other increases were 3801 tons in wire rods, 2147 tons in tin plate, 1588 tons in black sheets. Scrap shipments fell off 13,711 tons and other losses were small.

Scrap, in spite of the sharp decline, retained its position as the largest item of export in January.

The upward surge of imports in December was short lived and January imports fell to the smallest since March, 1933, a decline of 8457 tons from December, but a gain of 1058 tons over January, 1933.

FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

Gross Tons

	1934		1933	
	Imports	Exports	Imports	Exports
Jan.	22,653	178,023	21,892	56,720
Feb.	.....	.....	19,748	63,936
Mar.	.....	.....	22,114	80,567
April	.....	.....	28,061	100,395
May	.....	.....	26,295	123,069
June	.....	.....	34,368	102,581
July	.....	.....	52,805	83,311
Aug	.....	.....	46,839	119,374
Sept.	.....	.....	55,706	108,799
Oct.	.....	.....	46,673	164,755
Nov.	.....	.....	28,979	157,600
Dec.	.....	.....	31,310	184,585
Total	.....	.....	414,790	1,350,692

UNITED STATES IMPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

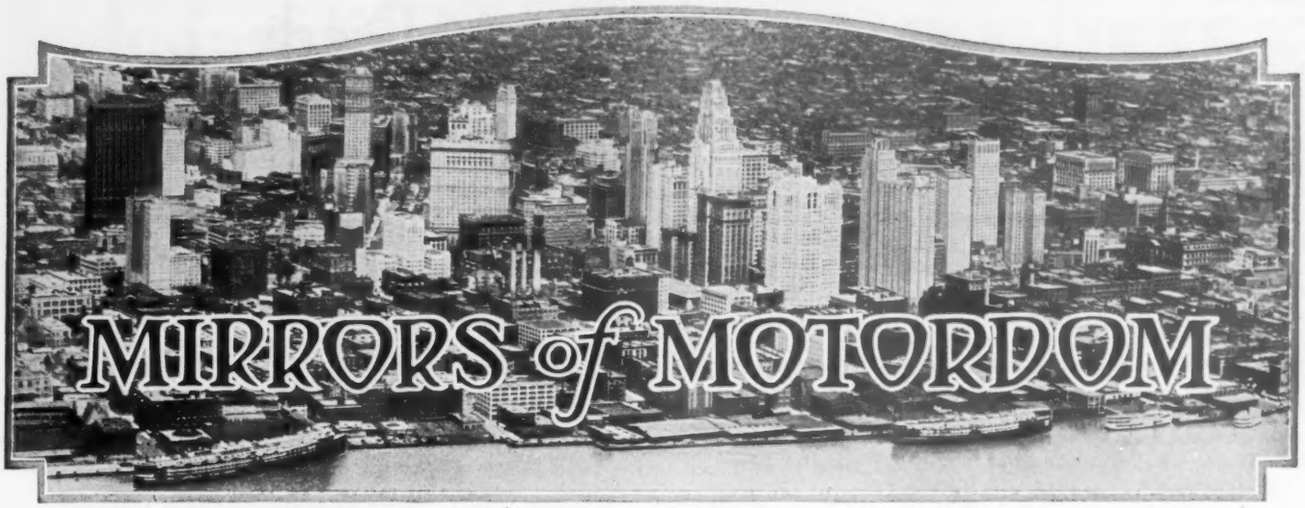
Commodity	Jan., 1934	Dec., 1933	Jan., 1933
Pig iron	11,886	15,531	6,444
Sponge iron	45	.....	.....
Ferromanganese, spiegeleisen	1,413	4,123	3,256
Ferrochrome†	1	.....	.....
Ferrosilicon†	35	62	4
Other ferroalloys†	.....	.....	1
Scrap	1,160	396	212
Steel ingots, blooms, etc...	54	101	3
Concrete bars	46	116	266
Hollow bar, drill steel	61	102	87
Merchant steel bars	1,033	2,082	1,664
Iron slabs	1	.....	1
Iron bars	46	60	15
Wire rods	747	1,143	1,196
Boiler and other plate	17	3	40
Sheets, skelp, saw plate	488	723	1,237
Tin plate	3	28	19
Structural shapes	1,030	2,323	1,673
Rails and fastenings	190	103	201
Cast iron pipe, fittings	2	.....	54
Welded pipe	255	260	280
Other pipe	527	326	77
Barbed wire	1,549	1,385	1,717
Round iron, steel wire	258	192	155
Telegraph, telephone wire	1	1	16
Flat wire, strip steel	49	134	65
Wire rope, strand	145	201	127
Other wire	2	111	225
Hoops and bands	823	1,267	1,445
Nails, tacks, staples	605	324	1,007
Bolts, nuts, rivets	28	27	20
Horse and mule shoes	26	7	35
Castings, forgings	127	179	52
Total, gross tons	22,653	31,310	21,595

†Alloy content only.

UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Commodity	Jan., 1934	Dec., 1933	Jan., 1933
Pig iron	326	448	371
Ferromanganese, spiegeleisen	.....	5	.....
Iron and steel scrap	87,272	100,983	31,803
Ingots, blooms, billets, slabs and sheet bars	455	150	91
Bars, iron	112	104	23
Bars, steel	3,316	3,095	1,085
Bars, alloy steel	388	443	30
Wire rods	7,011	3,210	711
Boiler plate	29	63	48
Other plate, not fabricated	2,016	3,101	292
Skelp, iron or steel	819	532	157
Iron sheets, galvanized	107	162	35
Steel sheets, galvanized	4,816	7,031	2,452
Steel sheets, black	5,748	4,160	2,557
Iron sheets, black	142	212	123
Strip steel, cold rolled	1,641	957	329
Hoop, band and scroll iron or steel	1,260	914	615
Tin, terne plate	21,118	18,971	4,433
Water, oil gas and other tanks, except lined	480	687	479
Shapes, not fabricated	1,143	1,048	581
Shapes, fabricated	1,886	1,856	338
Plates, fabricated	442	179	12
Metal lath	126	59	52
Frames, sashes and sheet piling	198	1,166	31
Rails, 50 pounds	11,871	6,663	2,315
Rails, under 50 pounds	396	2,439	5
Rail fastenings	2,812	2,828	283
Switches, frogs, crossings	93	189	19
Railroad spikes	679	500	62
Railroad bolts, nuts	248	614	21
Boiler tubes, seamless	481	279	297
Boiler tubes, welded	17	62	5
Casing and oil-line pipe, seamless	4,881	4,492	906
Casing and oil-line pipe, welded	693	870	202
Seamless black pipe, other than casing	212	367	53
Malleable iron screwed pipe fittings	335	237	112
Cast iron screwed pipe fittings	173	128	80
Cast iron pressure pipe and fittings for	751	125	164
Cast iron soil pipe and fittings for	166	222	190
Welded black steel pipe	1,690	1,876	514
Welded black wrought iron pipe	58	73	32
Welded galv. steel pipe	1,966	2,136	802
Welded galv. wrought iron pipe	86	39	45
Riveted iron or steel pipe and fittings	31	2	2
Plain iron or steel wire	1,146	1,016	184
Galvanized wire	2,372	2,330	206
Barbed wire	2,196	3,426	831
Woven wire fencing	139	119	61
Woven wire screen cloth	36	98	40
Wire rope	284	232	107
Other wire and manufactures	470	316	173
Wire nails	866	1,115	601
Horseshoe nails	65	56	64
Tacks	30	43	30
Other nails, staples	213	272	121
Bolts, machine screws	424	441	185
Iron castings	613	567	319
Steel castings	93	71	48
Car wheels and axles	306	479	777
Horseshoes	22	4	3
Iron, steel forgings, n.e.s.	258	323	203
Total	178,023	184,585	56,710



DETROIT

LAST week Detroit knew it was sitting over a powder barrel that was clearly labeled, "Strike and Labor Trouble."

The barrel had a good many fuses that could have touched off the whole charge—actually, one fuse for each of the district's motor plants—and, luckily, though none went off last week, several spluttered loudly enough to attract Washington's eye, with the resultant promise that an official review there will be given to fomenting automobile labor on March 14.

This review, in the form of a hearing before the national labor board this coming Wednesday, does and does not solve the problem. True, what looked like the beginnings of a general strike at Detroit early last week were staved off, but many believe the judgment day is only being postponed. If the Weirton Steel Co. labor case is any parallel or precedent, Detroit's labor troubles may be strung out indefinitely.

At all events, this labor angle to the automobile industry is not a healthy one for the time being. Just a year since its last major trepidation —when bank collapses engulfed Detroit—potentialities in the labor situation here are conceded on all sides to have inherently all of the bank holiday's fireworks. Bank holidays, forest fires and strikes all have one common characteristic—they spread like wildfire.

With such an imposing threat to motordom's manufacturing activities, there is no certainty even from day to day that March's or likely April's planned assembly schedules can actually come to pass. For the time being, plant production managers are closing their eyes and still talking of a new 1934 production high to be set in March, but Detroit hears many tunes that sound like whistling in the graveyard.

It is news that has come to the surface only the past week to the effect that union-incited labor might

Labor's 7-Point Ultimatum

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More Furnaces on at Ford

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Assembly Schedules Higher

tangle the industry's speeding rate of production, for Detroit has heard ominous rumblings dating back to last summer's tool and die strike.

But, to relate developments as they happened last week when some of labor's demands and ultimatums took form: On Sunday, March 5, about 200 heads in the Automobile Workers' Federal Labor Union met in a Lansing, Mich., hotel, and as representatives of union chapters at Lansing, Flint, Pontiac and Detroit, drafted a seven-point ultimatum.

This contained the following requests and was dispatched by telegram to Buick Motor Co., Hudson Motor Car Co., and Fisher Body's Flint plant:

1. Reinstatement of all employes who have been discharged because of their union activities.
2. Granting of wage rates to approximate the 1928 level.
3. Establishment of a 30-hour week, or five days of six hours each. In view of the present code, however, of 40 hours it was demanded that at least this be lived up to instead of 48-hour weeks at present.
4. Time and a half pay for all overtime after eight hours in any one day and double time for Saturdays and Sundays.
5. Elimination of the bonus system, or simplification of it, so that each worker may know at the end of each day his efficiency rating. Request that a union representative, with the time study man, be allowed to supervise efficiency rating computations.
6. Establishment of a board of arbitration, consisting of two representatives of the employers, two of the employes and an impartial chairman to be chosen by the national labor board.
7. Seniority of service to prevail so that employes shall be laid off and rehired according to their length of service.

Buick at Flint and the Fisher Body plant there, which makes Buick as well as some Chevrolet bodies, were both given until March 7 to comply with these requests, which obviously inferred recognition of the group making the demand—the automobile industry affiliate of the American Federation of Labor. Hudson was granted until March 8 to reply. The March 14 hearing, though, has averted this ultimatum.

At the same time, telegrams were dispatched to President Roosevelt asking that election machinery be set up at these points to give the men the right to organize for collective bargaining.

Through all the developments of the past week Detroit has found it difficult to reconcile the fact that the industry is employing 300,000 men today where it employed 200,000 a year ago; that in most cases, as for instance Chevrolet, rates of pay are back to 1929 levels; that there is a heavy demand for skilled labor.

Too, it is difficult to realize that last Tuesday, the day after the above demands were made at Hudson, long lines of men braved the cold looking for work at the Hudson employment office.

Partly because the strike threat looks now to be more serious in the automobile industry than in steel, auto makers are not stocking steel to any degree. Unchanged second quarter prices on steel also contribute to hold down any speculative steel buying. Steel shipments to Detroit, while heavy, are very much on a day-to-day basis.

FORD last week started up three more open-hearth furnaces and now has seven of its ten units in operation. This is Ford's highest steelmaking rate in several years and

compares with 1930-1933, inclusive, when for a majority of these years most of the open-hearth furnaces were cold. Furthermore, the large 400-ton mixer at Ford's probably will be put on within the next few weeks. Repairs are being made to the brick work of the two open hearths not in operation at River Rouge.

Ford is not only making steel, but also using it. Little of present tonnage is going into stock. Car assemblies are running very close to 4000 models daily, although motor block castings at the River Rouge plant are down to around 2700 per day. Bank of parts there finds Ford for the time being well ahead on not only motors but also on such items as lamps, trim and other hardware.

Ford's March schedule will be 83,000 models and April, so Detroit understands, will see a schedule shooting for 105,000 units at River Rouge. A daily rate of 5000 units is confidently expected by the Ford organization next month.

When Ford will let the public in on his streamline job is a matter of only a short time. As STEEL reported almost a month ago (Feb. 19, p. 17) the model soon to be brought out eclipses even Chrysler's efforts at streamlining.

For the time being, Ford will present this streamline body only on the victoria models. The motor is the unchanged Ford V-type eight-cylinder power plant; mechanical changes have been minimized in favor of the decided departure in body appearance.

A Detroit body plant has turned out a number of these victoria bodies but no quantity assemblies have yet been recorded at River Rouge. For the present, it is a certainty that the streamline victoria models of Ford are a trial balloon and not the beginning of a complete and rapid swingover by Ford to streamlining on all models.

IN THE meantime, Chrysler and DeSoto at the Kercheval plant are rapidly swinging into assemblies on the airflow models. Last week as high as 300 of these models were made in a day. The unfilled order bank is high, calculated at more than 10,000 units.

Plymouth may produce and ship 40,000 models in March; Dodge 15,000; Chrysler and DeSoto probably 4000 to 5000, although this latter depends on how rapidly production on the airflow models can be increased.

In all, Chrysler Corp. will do well to live up to the 92,000 models the company recently claimed it would make in March. Some breakdown on this over-all figure shows Chrysler's March will be good, but it will not touch 92,000 jobs. Attainment of this production would set a new high for any month in the company's history.

Chevrolet plans a 100,000-unit March after a 72,000-unit rate last month. February, aside from being a short working month, saw assemblies mount from 2500 at the beginning to 4000 by March 1, Chevrolet will have to do better than 4500 cars a day to reach 100,000 in March.

Such may be done by a late-month spurt, but as conditions are recorded now it looks as though Ford with his planned 83,000 assemblies will come the closest to hitting the mark among the leaders.

Chevrolet employment, incidentally, touched a new high last week with over 60,000 men on the payrolls. This is about 8000 more than the previous peak of June, 1929.

Buick, having bought some steel recently for its projected small job, seems still undecided on when to throw the production gear into high on this small streamline series. Assembly rates on the present series still hover around 500 daily.

It has been about definitely determined that the small Buick to come will also have knee-action wheels. Some believed this feature would be omitted, both in view of the cost item and also the effect of the decision of Chevrolet to use leaf springs on the economy six now being groomed. Buick, which bought steel for 45,000 jobs early in January, may be in the market for a buy very shortly.

To Hudson goes the palm for a production increase last week, strike threat or not. Daily assemblies went over 650 and three lines were running. Hudson is planning on turning out 1000 a day before March is out but to do so will no doubt have to refit the fourth assembly line, unused for several years. Hudson's unfilled order bank is running considerably more than 25,000 models.

Last week LaSalle swung into its first production of 1934; so did Olds on its six-cylinder job. Graham is trying to get up to 100 assemblies a day with the view to making 6000 models by June 1. Lincoln may release parts soon on 500 more models. Reo will start this week on its Flying Cloud models for 1934.

Packard assemblies, contrary to the trend, have been tapering but this is attributable to its earlier introduction which dates back to last fall plus the fact that specifications on many of the present parts are being cleaned up preparatory to some sort of a change.

So, though production increases are the order of the day, Detroit pauses to wonder on a mighty "if." If labor troubles don't come to pass these March assembly schedules will be confirmed, but Detroit is nervous and certain March will hinge on day-to-day developments.

Died:

ELBERT A. GIBBS, 52, vice president in charge of operatons for McClintic-Marshall Corp., Bethlehem, Pa., in Aiken, S. C., March 6. He joined the company in 1907, being successively engineer in charge of estimating and designing, manager of erection for all operations west of Pittsburgh, general manager in charge of all fabricating and erecting, and in 1929 vice president and general manager. In 1931 he was made vice president in charge of production. He saw two years of war service, attaining the rank of colonel and receiving the Distinguished Service medal.

□ □ □

Isaac Wilkoff, 48, president and treasurer of the Wilkoff Co., Youngstown, O., scrap iron and steel company, in Washington, March 7, while attending the NRA code conference. He was a director in the Weirton Steel Co., Youngstown Sheet & Tube Co. and Institute of Scrap Iron and Steel.

□ □ □

William J. MacFarland, 69, partner in MacFarland & Little, Philadelphia steel supplier, in Atlantic City, N. J., March 4.

□ □ □

John Ingram, 47, purchasing agent for the New Kensington, Pa., plant of Aluminum Co. of America, in New Kensington, Feb. 28.

□ □ □

Malcolm McGiffin, 61, president of the Fidelity Trust Co., Pittsburgh, and also a director in the Jessop Steel Co., Washington, Pa., in Pittsburgh, March 1.

□ □ □

Arthur C. Harvey, 69, retired president of the Arthur C. Harvey Co., Allston, Mass., at his home in Boston, March 6. During his business career he was closely identified with the iron and steel industry.

□ □ □

Jay G. Weiss, 67, former president of the Hyatt Roller Bearing Co., Newark, N. J., in Miami Beach, Fla., March 1. At one time he was head of the Lancaster Steel Co., Lancaster, Pa. He retired 15 years ago.

□ □ □

Frank R. Wheeler, widely-known engineer, at his home in Chicago, March 1. He was a specialist in condensing equipment, having served as a technical engineer with the Northern Pacific railroad and various engineering companies.

□ □ □

Charles E. Cole, 61, former dock superintendent for the M. A. Hanna Co., at Cleveland, and well-known throughout the Great Lakes district, in Cleveland, March 5, after a short illness. In 1903 he was named superintendent of the C. & P. ore dock at

(*Please turn to Page* 66)

Industrial Men in the Day's News

Charles H. Rhodes, Assistant General Manager of Sales, Illinois Steel Co.

Long associated with the steel industry, his early career was spent in the Pittsburgh district.

Later he became purchasing agent for a Canadian steel company, subsequently moving to Chicago.

Purchasing agent for a number of Steel corporation subsidiaries until 1929, he now is active in sales work.

CHARLES H. RHODES, recently appointed (STEEL, Jan. 15) assistant general manager of sales, in charge of sales of bars, strip and alloy steels, of the Illinois Steel Co., Chicago, has served with several subsidiary companies of the United States Steel Corp. principally in the capacity of purchasing agent.

Born in Newcastle, Pa., he spent the early period of his industrial career at Pittsburgh where he was identified with the purchasing department of the American Steel & Wire Co. from 1899 to 1917. In the latter year, when he was district purchasing agent, he left to become purchasing agent for the Canadian Steel Corp., Ojibway, Ont.

Mr. Rhodes later went to Chicago as purchasing agent for the Illinois Steel Co. and in connection with that office served as purchasing agent for the United States Fuel Co., Lafayette Fluorspar Co., Gary Heat Light & Water Co., and Gary Land Co.; western purchasing agent for the Universal Portland Cement Co.; and general purchasing agent for the Minnesota Steel Co., Duluth.

Resigning from these offices in December, 1929, he resided in Flintridge, Calif., until he returned to Illinois Steel in July, 1933, to become associated with the sales of rails and track fastenings. In his new capacity he succeeds William I. Howland Jr., recently appointed vice president and general manager of sales.

□ □ □

Harold W. Golden, sales engineer with William K. Stamets, Pittsburgh machinery interest, has been appointed district manager of that company's Cleveland branch in the Rockefeller building. He joined the Stamets organization in 1927, prior to which he had been employed for 12 years on engineering and production work.

□ □ □

Donald A. Pyke, for a number of years chief estimator for the McCord Radiator & Mfg. Co., Detroit, has been appointed purchasing agent, succeeding J. H. Cooper, now assistant to the president. Edwin H. Walters and William H. Bearinger will be assistant purchasing agents.

□ □ □

Dr. Allan Chester, formerly vice president of the Stanford Chemical Co., New York, and J. C. Weaver, formerly vice president of Weaver Bros. Co., Adrian, Mich., have been appointed to the staff of the Ferro Enamel Corp., Cleveland, to supervise sales of a recently developed electrolytic pickling machine.

□ □ □

Orin F. Torbron is now representing the Lamson & Sessions Bolt Co., of Birmingham, Ala., in Texas and the Southwest.

□ □ □

Ernest T. Giles, for the last three years vice president in charge of sales for the National Fireproofing Corp., Pittsburgh, has returned to Ketchum, MacLeod & Grove Inc., advertising agency.

□ □ □

Morris E. Leeds, president of Leeds & Northrup Co., Philadelphia, has been named vice chairman of the industrial advisory board of NRA. For years he has been active in behalf of stabilized employment and prevention of unemployment, being a member of the advisory committee on industrial relations of the National Industrial Conference board.

□ □ □

R. A. Zilm, formerly domestic and European sales representative of the Lees-Bradner Co., Cleveland, is now affiliated with the Cleveland Duplex Machinery Co. Inc. in the sale of machine tools and special machinery. Prior to his connection with the Lees-Bradner Co. he was associated with the Otis Steel Co., Cleveland, in the foundry and sales divisions.

□ □ □

Harry Grant, Grant Iron & Metal Co., Detroit, has been elected president of the Cleveland-Detroit chapter of the Institute of Scrap Iron and Steel. B. L. Newman, Newman Iron & Steel Co., Cleveland, is now chairman of the executive board. Other officers elected include: Vice presidents, David Rotter, Rotter-Speer Co., Cleveland, and Carl Mirman, Akron Scrap Iron Co., Akron, O.; secretary, Joseph Vasek, Max Friedman Co., Cleveland; treasurer, Abner L. Cohen, M. Cohen & Son Co., Cleveland.

Harold W. Faint

Who as noted in STEEL for March 5 has been appointed to the sales engineering staff of the Udylite Process Co., Detroit, with headquarters in Chicago

□ □ □

I. W. Solomon, of I. W. Solomon Co., Pittsburgh, has been elected president of the Pittsburgh chapter of the Insti-

(*Please turn to Page* 66)

EDITORIAL

Confidence—Not Baiting of Industry—Creates Jobs

PRESIDENT Roosevelt's address last Monday to members of code authorities and the subsequent proceedings of the sessions on NRA present a new challenge to industry which should be met honestly and courageously.

In a nutshell, here is the problem the President seeks to solve:

> NRA, PWA and the other agencies which were counted upon to relieve unemployment fell below expectations. CWA was launched hurriedly to ease the strain during the winter months, but to continue CWA beyond the next month or two would entail more of a drain on government funds than the President's financial program can stand safely. Therefore, he seeks to shift burden of employment from CWA to industry.
>
> To accomplish this, he proposes that industry reduce hours further without cutting the present weekly wage level. He appeals to industry to forego profits for awhile longer in order that this further stretching of the spread-work idea can be accomplished. Inferentially he acknowledges that industry may not have the funds to do this and assumes that the recently proposed credit banks will supply capital to hard-pressed employers.

We believe that an overwhelming majority of industrial executives concede that it is desirable for industry to absorb as many unemployed workers as can be handled safely without impairing recovery. Many companies were spreading work voluntarily long before the advent of the present administration. When NRA became effective, they again expanded the plan.

Steel Industry Has Enviable Record in Spreading Work During Depression Period

As a result of these policies, the iron and steel industry in January, 1934, was employing 393,000 workers, compared with 420,000 in the peak of activity in 1929. Operations in January were at 34.13 per cent of capacity, as compared with 99.59 per cent in May, 1929. Stating it another way, the industry employed 420,000 workers in May, 1929, when 5,273,167 tons of ingots were produced, and 393,000 in January, 1934, when the output was only 1,996,897 tons.

This shows conclusively that the steel industry has gone a long way toward reabsorbing the unemployed who are justified in looking to it for jobs. On the basis of January figures, only 27,000 remained to be hired to bring the total up to the peak. Undoubtedly the margin has been reduced appreciably by the gains of February and early March.

It is conceivable that the industry, if favored with a steadily increasing demand for its products, may be able to go beyond the 1929 employment. Its leaders undoubtedly will be glad to attempt to do so, if given an opportunity. Likewise, in other branches of the iron, steel and metalworking industry, employers generally are anxious to stimulate employment as far as it is practicable to do so.

But, does the government really encourage industry to co-operate in this manner? Notwithstanding the extravagant lip service by administration spokesmen to the "wonderful opportunity" it is offering to industry to "govern itself," is industry really being given a fair chance at self determination?

Government, Ostensibly Seeking Co-operation Of Industry, Actually Discourages It

Reluctantly we are forced to conclude that the answer is "No." If the administration's current plea for more employment were entirely fair and sincere, it would not have been accompanied by the suggestion by a cabinet member that the steel industry absorb 300,000 and the "machinery" industry 500,000 more workers than they already have absorbed. Nor would the NRA meeting have been preceded by the disclosure of a few high industrial salaries—calculated to give the public the idea all executive salaries are unduly high. Nor would implied administration sanction of the Connery 30-hour bill and of the Wagner closed union shop bill have been permitted to hang as a club over the heads of the assembled members of the code authorities.

President Roosevelt has an admittedly difficult problem in relieving unemployment. Industry understands the problem clearly and will help to solve it if the administration will give it a chance.

The greatest boon to re-employment possible under present circumstances would be a return of confidence among employers. If the President would declare a moratorium for 90 days on "industry baiting," if he would attempt to hold in abeyance for three months all disconcerting proposals such as a blanket 30-hour week, destructive securities regulation, unconstitutional closed union shop, etc., confidence would be restored to the point that employers could co-operate in re-employment more effectively.

If the administration persists in demanding too much of industry on one hand, while destroying confidence on the other, the inevitable result will be reduced employment.

THE BUSINESS TREND

Trend Upward, But Unbalanced Condition Continues

EVERY important indicator of business shows continued gains in the general trend, but no marked improvement in balance. In other words, the favored industries—automotive, refrigerator, agricultural implement, and various miscellaneous lines—are making gratifying progress, while in heavy equipment, building construction, etc., the pace still is discouragingly slow. Moreover, the attitude of the government, as indicated by its expressions of the past several weeks, tends to ignore this unbalanced condition and to indulge in activities which threaten to further widen the gap between the swift and the slow.

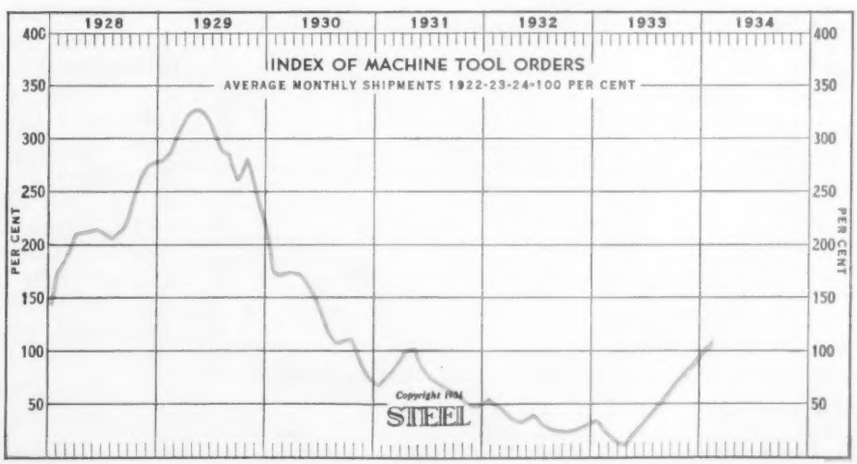
The natural impulse of industry to go ahead if not discouraged too much by fear of legislative and bureaucratic restraint, is reflected in the activity of consumer goods lines, such as automobiles and refrigerators. Here one finds numerous instances of capacity operations and of acute shortage of certain types of skilled workers.

Due partly to this condition, car loadings in the week ending March 3 are expected to top the 600,000 mark—the highest point since last November. Electric power demand for the same week jumped 16½ per cent ahead of the corresponding week of 1933, this being the greatest gain of this character since July, 1929. The report of one of the two largest Chicago mail order houses, showing sales for February were 52 per cent in excess of sales for February a year ago, reflect the improvement in rural and small town conditions. Meanwhile, steelworks operations are climbing steadily and today are near 50 per cent.

Industry Reduced Its Losses in 1933; Still in Red, It Faces New Labor Problems

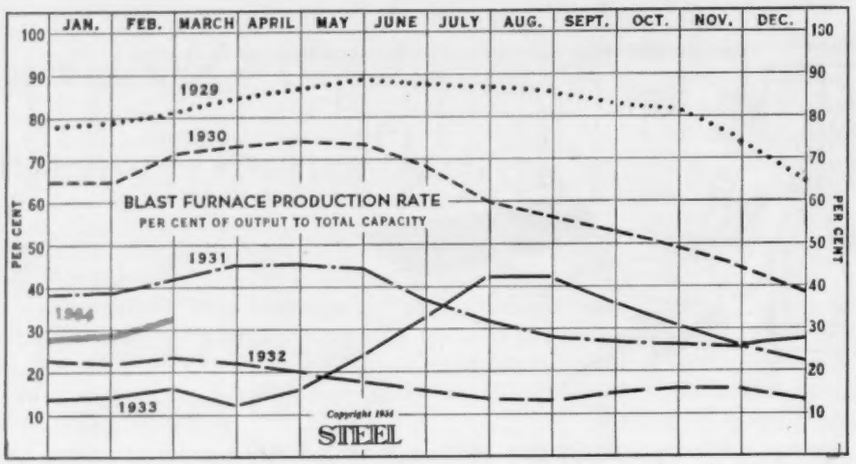
These improvements are matched by slightly more favorable earnings reports for some companies. From preliminary estimates, it appears that the steel producing industry has cut its losses from about $160,000,000 in 1932 to about $60,000,000 in 1933. A few industrial companies have reported encouraging earnings, but, in general, the iron, steel and metalworking industry still is in the red.

Threats of labor trouble still are prevalent, but serious outbursts have been avoided. New seeds of discontent are being sown by current activities in Washington, which create a further hazard for industry.



1934	
Jan.	103.6
1933	
Dec.	92.0
Nov.	68.6
Oct.	60.1
Sept.	55.7
Aug.	50.4

1933	
Jan.	33.1
1932	
Dec.	31.7
Nov.	29.6
Oct.	28.4
Sept.	27.7
Aug.	30.3



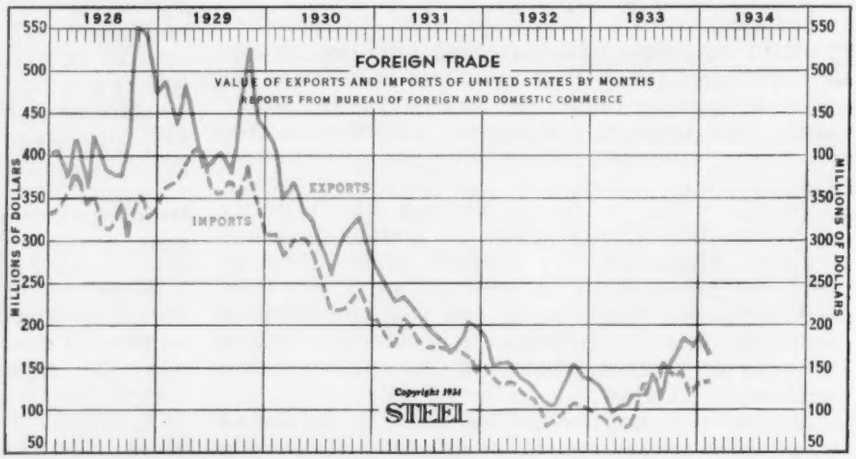
	Per Cent
February, 1934	32.9
January, 1934	28.7
February, 1933	14.3

90 Blast Furnaces Active At End of February

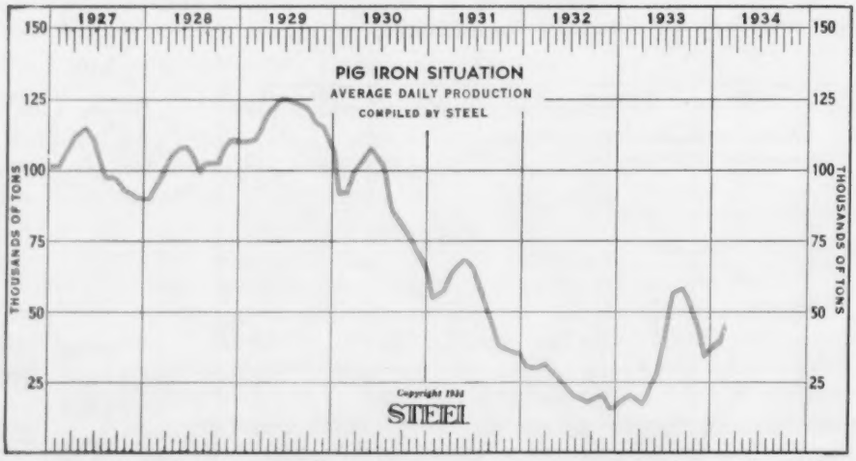
With the total output of pig iron showing an increase of 46,292 tons in February, four blast furnaces were added to the active list. Operating furnaces on Feb. 28 totaled 90 as compared with 86 on the last day of January. This was the largest number of furnaces active at the close of any month since last August, when 98 were producing iron. Relating production to capacity, the operating rate for February was 32.9 per cent, against 28.7 in January and is the highest since last September, when the rate was 36.4 per cent.

January Foreign Trade Declines Slightly

The report of this country's foreign merchandise trade in January shows no improvement over the preceding month. Exports were valued at $172,000,000, a decline of 10.7 per cent from the December valuation. Exports in January, 1933, were valued at $120,589,000, which was close to the lowest value for many years. Imports in January at $135,000,000 show a slight gain over the preceding month and compare with an import valuation of $96,006,000 in January, 1933.



Exports		Imports	
January, 1934	$172,000,000	January, 1934	$135,000,000
December, 1933	192,627,000	December, 1933	133,518,000
January, 1933	120,589,000	January, 1933	96,006,000



February, 1934	45,426
January, 1934	39,537
February, 1933	19,752

February Iron Production Gains 15 Per Cent

The average daily output of coke pig iron in the United States for February was 45,426 gross tons, a gain of 14.9 per cent over the previous month. This was the best daily production since last September and the highest February rate since 1931, when the daily average was 61,114 tons. In February a year ago, the daily output was only 19,752 tons and in February, 1932, the daily rate stood at 33,122 gross tons.

A few of the thousands of articles made of wire

PROGRESS IN MANUFACTURE AND USE OF WIRE AND WIRE PRODUCTS

BY F. H. NULLMEYER
Youngstown Sheet & Tube Co.

DURING the past decade about 8 per cent of all of the steel ingots produced in the United States went into use in the form of wire and wire products. The applications of wire are almost innumerable. They range from heavy towing cables to the spider lines in scientific instruments; involve the manufacture of wire from silver, platinum, copper, bronze and other metals, aside from iron and steel; and demand a great variety of physical and other properties in the material employed.

The manufacture of these metallic filaments or shreds known as wire has been traced as far back as early Egypt. A gold wire is mentioned in connection with the sacerdotal robes of Aaron. Metallic shreds dating back to 1700 B.C. have been discovered.

A specimen of wire made by the Ninevites 800 B.C. is exhibited at the Kensington museum. Homer and Pliny refer to similar products in their early writings. Metal heads with imitation wire recovered from the ruins of Herculaneum are in the Portici museum. From such remote eras up until the fourteenth century, wire, in the general acceptance of the term, was produced by hammering out strips of metal and not by the process of drawing such as is practiced at the present time.

In the Middle Ages this industry was extensively pursued, and the artificers thus engaged were termed "wiresmiths," but in the earlier days of manufacture, gold, silver and bronze appear to have been the only metals so treated.

However, it is fairly well attested by technical records that the present method of drawing wire was practiced in the Lenne district of Germany during the fourteenth century. We find in the histories of Augsburg and Nuremburg, dated 1351 and 1360 respectively, the term "drahtziehr" (wire drawer) mentioned in connection with this industry. Thus it is reasonable to infer

A Partial List of Uses of Wire

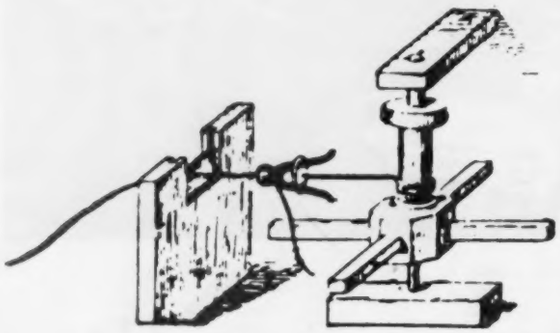
Bale ties
Baskets
Blinds
Bolts
Book bindings
Brushes
Buckles
Carding machines
Chain
Cloth
Clothes hangers
Clothes lines
Corkscrews
Corset stays
Curtain rods
Cycle spokes
Drawer pulls
Electric conductors
Fencing
Fenders
Fish hooks
Flour dressing machines
Gauze
Grilles
Guards
Hairpins
Hooks and eyes
Hoops
Hose armor
Kitchen utensils
Locks
Mats
Mattresses
Motor parts
Music wire
Nails
Needles
Netting
Paper clips
Picture cord
Pinions
Pins
Rivets
Robe rails
Scientific instruments
Screens
Screws
Sieves
Spangles
Spectacle frames
Spoke wire
Staples
Suspension bridge and other cables
Tacks
Tinsel
Tinworkers' articles
Umbrella ribs
Upholstery springs
Watch springs
Welding wire
Window cord

that draw plates were known and used at that time.

Possibly the first wire drawing mill was that erected at Nuremburg by a man named Rudolf shortly after the period mentioned above, or at least when the art of hand-drawing wire had reached some degree of excellence.

In France, about the year 1500, the art of wire drawing was ascribed to one Richard Archal.

Machine-drawn wire was produced in Great Britain in 1565. It was recorded that a Saxon, C. Schultz, and Caleb Bell went to England with some others and obtained Queen Elizabeth's permission to establish the industry.



Early method of drawing wire, showing wire pulled through die and wound on a spindle

Bell had charge of a mill in Greenfield Valley, Holywell, driven by water power. The queen was supplied with toilet pins from this mill, relics of which may still be seen. The spring from which Bell derived his source of power continues to be known as "Gallopell," evidently a corruption of the user's name.

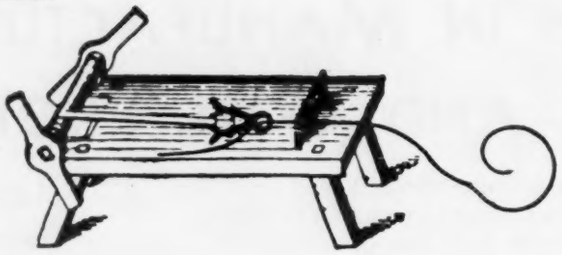
Inferior hand-drawn wire was then being manufactured in the neighborhood of the Forest of Dean and elsewhere in England. In the seventeenth century improved fabrication was carried on in Yorkshire, and later in the districts of Warrington and Birmingham, where the industry still is largely located.

In the year 1630, Charles I issued a proclamation to the effect that the home industry had made such advances that further imports of foreign wire were forthwith prohibited. This was the second trial of home trade protection. In 1465 importation of iron wire into England had been forbidden, but soon after this law was canceled owing to the inferior production of English manufacturers. The earlier wire of this period had been made of "Osmond" iron, produced from selected ore treated with charcoal fuel, and probably an imitation of Swedish iron.

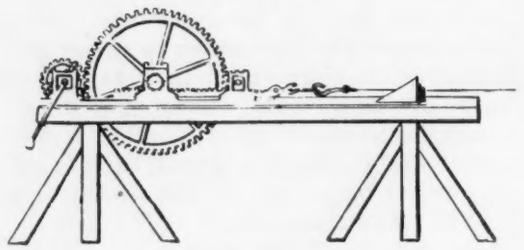
On Sound Basis in 1663

It was not until 1663 that the first mechanical wire mill proper was erected in England, at Sheen, near Richmond. From this date the industry was maintained on a fairly substantial footing and a series of progressive developments followed. The Warrington district has been continuously identified with the production of wire since 1800. At that time, Captain Ainsworth projected works in this neighborhood in concert with a practical wire drawer named Nathaniel Green. The firm of Messrs. N. Greening & Sons Ltd., still is operating in Warrington, England, and in Ontario, Canada.

In America, perhaps no firm is more deservedly well known than that of John A. Roebling's Sons Co., Trenton, N. J., which commenced business 100 years ago at Saxonburg, Pa. However, 18 years previous to this, Washburn & Moen began wire drawing in the United States. The Trenton Iron Co. also must be reckoned among the earliest founders of the wire industry in this country. With the exception of the Roebling company, the above named concerns, with numerous others, have become a part of the United States Steel Corp.



Another primitive method of wire drawing



Early sprocket wheel device for wire drawing

A few of the many present applications of wire are shown in the list on Page 25. To attempt to describe in detail the production processes associated with this range of product and manufacture would be impossible within the limitations of this article. Our discussion will be confined to the more important features.

Of particular interest are the more delicate classes of wire, which find application in scientific instruments such as astronomical telescopes, transits, levels, etc. Beautiful types of wire are used in the eye-pieces of such instruments in the form of hair or spider lines for assisting in the observation of terrestrial bodies.

Fine Wires in Instruments

So exquisitely fine are the wires thus employed that the hairs of our heads or the threads of the silkworm form but insignificant comparisons. The former average about 0.0025 inch in diameter, and the latter 0.0005 inch. Platinum wire has been drawn to 0.000025 inch. However, this is more a scientific curiosity than a production of practical utility.

It is recorded in the annals of physical science that Wollaston produced a platinum wire as fine as 0.00003 inch in diameter, and that 3180 feet of this wire weighed only three-quarters of a grain, which is at the rate of 1.25 grains per mile. This result was obtained by covering the platinum wire with a silver coating, which, after the wire had been drawn down to as fine a degree as possible, was finally dissolved off by a solution of nitric acid. A similar process is used today quite extensively in making copper clad wire, a steel wire coated with copper. The thin coating of copper forms an armor to protect the steel from corrosion.

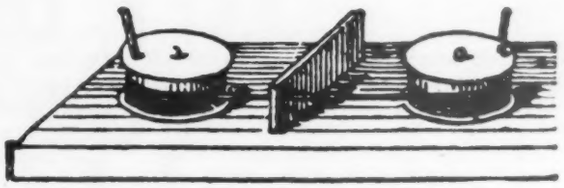
Wire flattened between rolls forms tinsel used for decorative purposes.

Watch springs constitute another useful product produced by the "flat rolling" method. This industry forms an interesting exemplification of the use of steel wire in a finely divided or worked form.

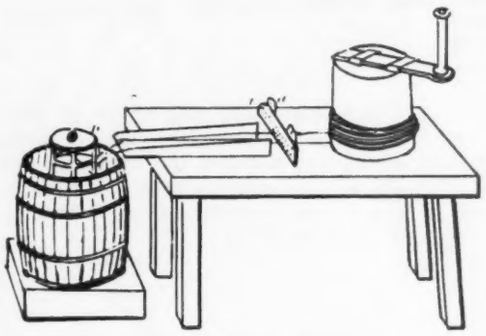
Many years ago Professor Babbage directed attention to the fact that hair springs weighing only 0.1 grain had been manufactured and that some 50,000 of such delicate articles were produced from one pound of iron. Such very fine sizes are more for exhibition purposes than for practical use.

Watch springs of sizes commonly employed in the trade weigh from ½ a grain to ½ a pennyweight.

It is now generally recognized that no more forcible example of the value of labor, as against the raw material, can be cited than that demonstrated by the manufacture of watch springs. Thompson remarks in his treatise on "Timekeepers": "The chisel of the sculptor may add immense value to a block of marble and the cameo may become a great price from labor bestowed upon it, but art offers no example wherein the cost of the material is so greatly enhanced by human skill as in the hair spring of a watch."



Equipment for drawing wire back and forth in longer lengths than was possible in other early methods



Wet wire drawing apparatus employed in the pioneering days of the industry

At the International exhibition of 1863, Messrs. Ganeval & Co., London, were awarded at gold medal for a hair spring, demonstrating how, by manual labor alone, an instrument was produced of 160,000 times the value of the raw material employed in the manufacture.

The hair spring of a watch is in the form of a flat spiral and determines the time of the oscillation of the balance wheel, which, in the case of an ordinary watch, is about four or five impulses per second. Prior to this time some watches contained pigs' bristles for causing the oscillation of the balance wheels.

In next week's issue, Mr. Nullmeyer, who is superintendent of the rod wire and conduit department, Youngstown Sheet & Tube Co., Youngstown, O., will discuss recent trends in rod mill design and practice and in methods of cleaning and pickling.

THE EDITORS

Process Recovers Sulphur Dioxide from Flue Gas

Co-operative studies on sulphur dioxide removal from flue gases were reported upon by Prof. Donald B. Keyes, head of the chemical engineering division, University of Illinois, Urbana, Ill., in addressing the New York section of the Society of Chemical Industry recently.

Doctor Keyes used the particular problem of sulphur dioxide recovery as an illustration of investigations which have been carried out at the university in co-operation with various industries.

The first method tried in this investigation was to scrub the flue gases with a solution containing a catalyst. Taking advantage of the oxygen present in the flue gases, the sulphur dioxide obtained in the solution was oxidized to form sulphuric acid. This process, however, was found to have certain economic disadvantages. A method subsequently was worked out to scrub the gases with a salt solution having a high solubility for the sulphur dioxide at low temperatures and a low solubility at higher temperatures. By means of this process the sulphur dioxide is recovered as a liquid product.

Conduct Further Tests on Rails at High Temperature

Late last year, the bureau of standards, Washington, completed the testing of specimens from a plain carbon steel railroad rail broken at elevated temperatures under extremely slow rates of tensile loading.

The data, considered with previous similar data, show that secondary brittleness, as revealed by low values for elongation and reduction of area in a tensile test, occurs at a temperature of 840 degrees Fahr., under a low rate of loading instead of at a temperature of 1020 to 1110 degrees Fahr., at which this phenomenon occurs when the load is applied somewhat faster or even at an extremely rapid rate as in impact.

Results of these tests are believed to have an important bearing on the formation of the hidden defects in rails, known as transverse fissures.

Announces New Course in Blueprint Study

Training in reading blueprints intelligently is offered in a new short course for correspondence study, announced by the Extension division, University of Wisconsin, Madison, Wis. In three parts, the course offers help in understanding general, civil and structural, or mechanical engineering blueprints. No time is spent in explaining how drawings should be made, except where the method is essential to understanding the print.

This course was prepared by the Extension department of civil and structural engineering, Prof. H. E. Pulver in charge.

X-Ray Inspection Explained For Man in the Field

Industrial Radiography, by Ancel St. John and Herbert R. Isenburger; 232 pages, 6 x 9 inches; published by John Wiley & Sons Inc., New York; supplied by STEEL, Cleveland, for $3.50, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

The purpose of this book on radiography is to present the practical aspects of its industrial practice in form and language understandable by students, laymen and engineers who seek useful knowledge of the basic theories involved. It is not designed to be a scientific treatise or a comprehensive work on all the theories.

The effort has been made to make the volume helpful to workers in the field in performing their investigations or inspections, to stimulate teaching and study of industrial radiography in technical schools and to direct attention of engineers and others to the potential value of the new technique in activities where its use has not been fully realized.

The infancy and early years of radiography are presented, followed by its present status. The nature and properties of X-rays are discussed, with observations on the interrelation of matter and the rays. Production of the rays, their detection and recording are also discussed. The book then takes up the practical side, installation, procedure in making a radiograph and interpretation of the result. Radiography as applied to large castings and forgings, to welded vessels and structures and small objects is described. Examples are presented, operating and cost data outlined and a chapter is devoted to gamma rays.

PROGRESS IN STEELMAKING

REFRACTORY insulating brick, which withstands temperatures up to 2500 degrees Fahr. without a protecting course of firebrick, now is being marketed. The new product is light in weight and has no appreciable shrinkage at 2500 degrees Fahr.

♦ ♦ ♦

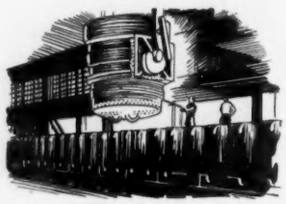
Ingots up to 300 tons will be handled by a forging press designed to give a pressure of 15,000 tons and now being installed in Russia. The unit is 124 feet high, the portion above the floor level being 83 feet high. When completed the entire press will weigh 3500 tons; its base beneath the floor will extend horizontally 250 feet.

♦ ♦ ♦

Doubling the life of a spindle on a 24-inch sheet bar mill in the Great Lakes district was accomplished by applying hard facing on each end and both sides to a depth of ⅛-inch and over an area of 1¼ x 8 inches. Stopping backlash in the boxes also effected a large saving in gears.

♦ ♦ ♦

Appreciable tension applied to strip between the discharge end of an annealing furnace and the coiling machine is avoided at an Ohio plant by a simple loop control device. Two idler rolls are provided just ahead of the reels, the strip being supported between the rolls in the form of a catenary. Two balanced beams, each having a light contact roll, extending across one-half the width, are provided so as to control independently the height of the loop. A motor-operated rheostat is connected to the field of each of the reel motors. Actuation of the rheostats is by contacts on the balanced beams. Thus when the loop tends to rise, the speed of the reel motor is reduced, or if the loop recedes, the motor speed is increased. A slight overbalance is carried on the beams to keep the controlling roll in contact with the work. The tendency is for the loop to rise continuously, due to the increasing diameter of the coil, and the principle function of the control is to reduce the speed of the reel motors gradually as the coils build up. The arrangement is fully automatic for any gage of strip, speed of travel or rate of build-up of the coils. Any tension necessary for smooth laying of the turns is secured by friction clamps.



MOLD life depends to a large extent upon the weight of the mold, according to practice at an open-hearth shop in the Pittsburgh district. For a given analysis it has been found that as the mold weight increases the mold campaign also increases. For example, the life of a 21-inch diameter mold was increased 40 per cent by increasing the weight of the ingot from 12,000 to 16,000 pounds or about one-third.

♦ ♦ ♦

Finely divided lead is the protective element in a new compound for pipe joints, service cocks and slow-speed gears. The compound is claimed to withstand temperatures up to 430 degrees Fahr. and not to lose its lubricating stability until 590 degrees, the melting point of lead, is reached.

♦ ♦ ♦

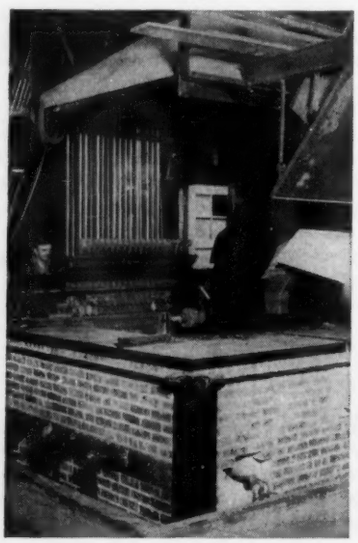
Transporting and piling hot and cold finished sheets either in the mill, warehouse or fabricating plant is facilitated by the development of a tiering machine of 10 tons capacity. The unit is capable of tiering sheets 10 feet long to a height of 6 feet. A power-operated transverse lift hook mechanism permits handling bundled stock from 1 to 5½ feet long and any width. Approximately 800 tons of sheets can be handled by a mechanism of this type in 8 hours.

♦ ♦ ♦

Efficient shape and angle of wire drawing dies are had when the area of contact between the wire and the die is four times the area of the starting action, according to an authority on wire drawing.

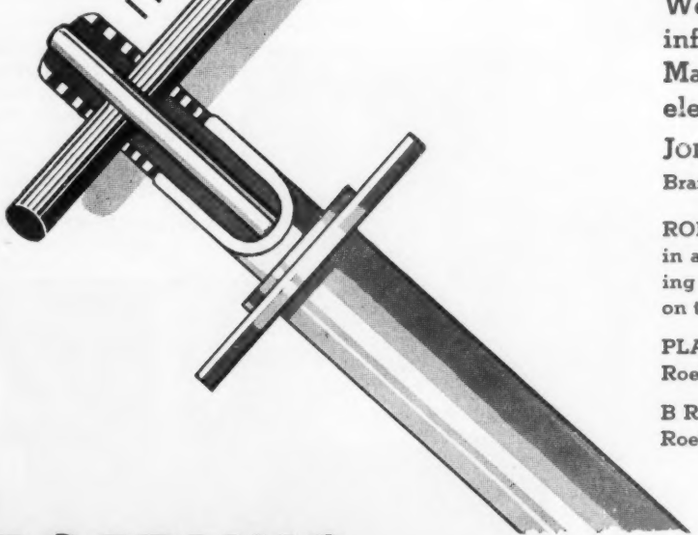
♦ ♦ ♦

Drilling holes in salamanders at blast furnaces for planting the explosive, and in brickwork at iron and steel works for miscellaneous purposes, is accomplished readily by the use of a newly developed 3-point drill. The points of the drill may be resharpened easily on any grinding machine. Not only can the unit be used until it is worn down to the shank, but accurate holes are insured by the cutting lips and breakage reduced to a minimum.



Yes— IT'S THE STEEL

IT'S THE CUSTOM-MADE STEEL THAT SPELLS THE DIFFERENCE!



CUSTOM-MADE Steel? What does it mean? It means just this...that the steel for Roebling Welding Wire is made specifically for welding purposes. It is *not* made on the usual tonnage basis but in small open-hearth furnaces... Of special, pure melting stock... By custom methods that permit exceptionally close control of the melt.

RESULT: A welding wire for exacting welders ...free of non-metallic inclusions...and absolutely uniform in quality.

We would welcome your request for full information and samples. Roebling Custom-Made Welding Wire is available in both electric and gas types.

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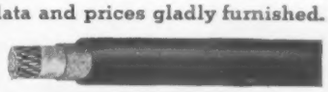
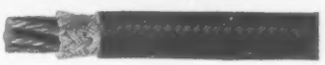
ROEBLING WELDING CABLES: these cables are made in a complete line for arc welding purposes. Many leading welders consider them to be the finest welding cables on the market. Samples, data and prices gladly furnished.

PLAIN RUBBER TYPE
Roebling Welding Cable



BRAIDED TYPE
Roebling Welding Cable



ROEBLING *Custom-Made* WELDING WIRE

FOR EXACTING WELDERS

Steelworks Adds to Research Facilities at Youngstown

RECENT extension of laboratory facilities at the Ohio works of Carnegie Steel Co., Youngstown, O., has included the construction of a new metallurgical laboratory building, completely equipped with the most modern equipment for testing and inspection of billets, slabs and other semi-finished products rolled at this mill, as well as the finished material from the 17 bar and strip mills of the district.

The new laboratory is a brick and steel building adjoining the present chemical laboratory, the latter being a three-story brick structure. Providing 6000 square feet of additional floor space, the new building is two stories in height, the first floor measuring 40 by 120 feet, the second, 40 by 30 feet. The upper floor serves as office space while all equipment is installed in the lower floor which is about 3 feet below ground level.

Facilities are available for investigating metallurgical problems submitted by any of the mill's customers, and also for constant study of the quality of manufactured products with the view to their closer control and improvement. Modern testing and other laboratory equipment has been provided in this new specially designed building to furnish additional flexibility and added convenience in conducting this important research work.

A program of new equipment buying for the laboratory has been spread out over three years, the first year's appropriation having just been expended.

Furnace equipment includes two 10 x 17-inch electric pot furnaces for lead bath, cyanide and salt bath hardening work. Each is provided with automatic temperature controlling and recording equipment. A smaller box furnace is installed for experimental low-temperature heating, maximum being 1850 degrees Fahr.

For research on certain products, including high-speed steel, a controlled-atmosphere electric preheating furnace has been installed, alongside of which is another heating furnace, with silicon carbide electric resistance elements and atmosphere control, as well as automatic temperature control through platinum-iridium thermocouples. This furnace is capable of being operated continuously at 2500 degrees Fahr.

A 4000-pound steam-operated forging hammer has been installed to be used in fracturing samples and forging down billets to test-bar or some other desired size and shape.

Investigations to determine melting points are carried out conveniently in a small cylindrical gas-fired furnace, capable of being heated to 3200 degrees Fahr. The forging furnace also is gas-fired, 24 x 40 inches in size, and built up specially in the laboratory.

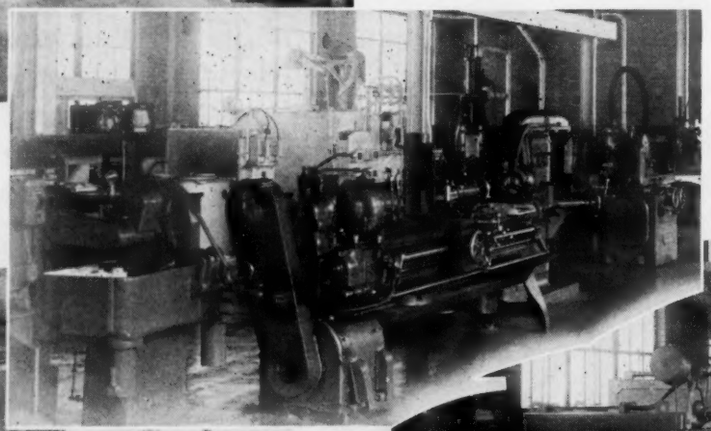
Pickle Full-Size Billets

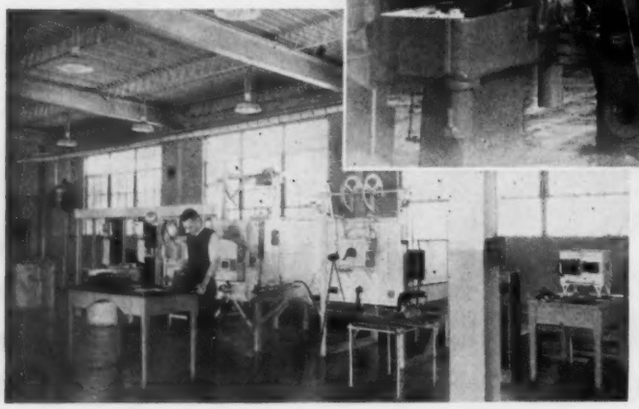
At one end of the laboratory and in an entirely separate building a pickle shed has been erected, in which a concrete tank is provided for pickling treatments. The tank will accommodate standard-size billets, inner measurements being 3 x 3 x 15 feet. In this shed also is arranged a sink and hood, and other facilities for deep etching tests.

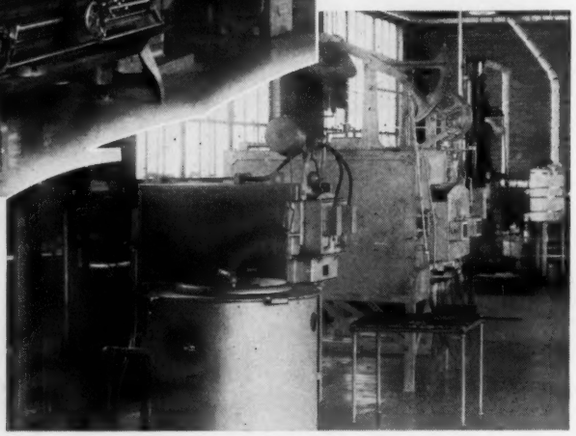
Returning to the laboratory proper, machine equipment includes a power hacksaw capable of handling a slab as large as 10 x 16 inches. The saw will operate at three speeds, has hydraulic lift and feed. This saw also may be equipped with two blades for cutting out a section of a slab or billet. Adjoining this unit is a smaller 6 x 6-inch power hacksaw.

Grinding needs are fulfilled by a new surface grinder with hydraulic feed, magnetic chuck and dust exhaus-

GENERAL view of laboratory, looking toward front, is shown above. Below is shown experimental furnace equipment







AT LEFT are underwater cutting machine, lathe, milling machine and grinder. Below are pot furnace, controlled - atmosphere box furnaces and, in background, forging hammer

ter equipment. Other new machine tools include a 34 x 10 x 19-inch milling machine with machine feed in all directions, and a geared-head engine lathe, with 14-inch swing and 10-foot bed.

Another interesting unit is a new underwater cutting machine, in which steel samples are cut by a high-speed rubber bonded wheel, the cut being carried out while the specimen is submerged in water. Dashpot control of cutting feed is used and a signal light arranged to indicate when the specimen is cut through.

Present testing equipment includes a new combination machine to measure both Charpy and Izod impact values of steel samples, and standard metallographic accessories such as polishing machines, cameras and the like for photomicrographic work.

Paraffin Polishing Wheels

The machine for polishing steel samples is interesting. Each of three polishing wheels is driven individually by a vertical-shaft three-phase motor operating at 450 revolutions per minute. Wheels are faced with paraffin, with standard varieties of abrasives used depending upon the degree of polish desired.

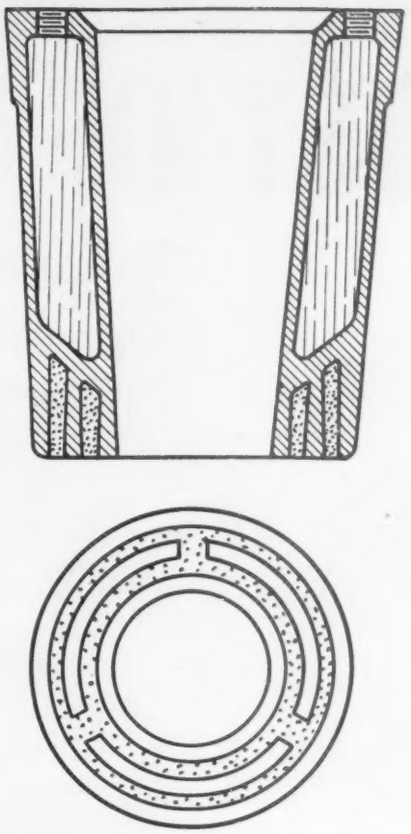
Machine equipment in the laboratory is all painted a standard machine tool gray, each unit being provided with individual electric motor operating on three-phase current at 220 volts. A new two-tower transformer station has been erected outside the laboratory building. Current is received from the mill power station, some 1400 feet distant, and is stepped down from three-phase 2300 volts to 220. Capacity of the laboratory is 300 kilowatts.

Heating is by steam with unit heaters located at intervals along the wall of the building. These heaters are equipped with motor-driven fans, controlled by thermostats, so that when the temperature drops below a set level the fans are started and force air over the steam-heated coils of the heater.

Research work is under the direction of T. S. Woodward, chief chemist and metallurgist, with a staff of six men co-operating in metallurgical investigations.

Tuyere Preserves Nose Profile

EXTENDED research and repeated trials, under both laboratory and blast furnace operating conditions have resulted in the introduction of an improved refractory-nose tuyere, known as the Beaton-Ledbetter tuyere. This new type cooling medium has been found highly resistant to conditions and materials at the furnace tuyere zone in adverse as well as normal operation, thus assuring long tuyere life.



Blast furnace tuyere equipped with refractory nose

This tuyere combines features of the Beaton tuyere with those of the Ledbetter tuyere, which was developed at one of the plants of the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. To this combination have been added many improvements which were developed during the past two years of investigation and research.

Probably the most important improvement in this new type tuyere, as cited by the Freyn Engineering Co., Chicago, is the refractory nose that is said to withstand all furnace operating conditions. The improved refractory is chemically neutral to slag and contains no reducible metallic oxides. It resists the materials and conditions in the hearth and bosh regions of the furnace, and remains in place to function as a protection to the tuyere.

The new type tuyere preserves its original length and nose profile not only because of the improved refractory material in the nose, but also on account of the properly designed combination of heavy walls now used on the nose. The third or middle wall of the Ledbetter tuyere is of value in retaining the refractory and protecting it against mechanical damage, and has been incorporated in the Beaton-Ledbetter tuyere. These improved features are depicted in the accompanying illustration.

The design of the water chamber has been improved by streamlining the interior of the chamber so that there are no congested spaces to retard water circulation and no air-bound spaces for air or steam to collect.

The Beaton-Ledbetter tuyere may be obtained from the Dixie Bronze Co., Birmingham, Ala., Hodgson Foundry Co., Smeeth-Harwood Co., both of Chicago, Lawrenceville Bronze Co., National Bearing Metals Corp., both of Pittsburgh, and Falcon Bronze Co., Youngstown, O.

Plea for the Practical Man In Production of Steel

Steel Makers, by Harry Brearley; 156 pages, 5½ x 7¾ inches; published by Longmans, Green & Co., London, Eng.; supplied by STEEL, Cleveland; in Europe by Penton Publishing Co. Ltd.., Caxton House, Westminster, London.

The author has taken up what he characterizes as an unpopular idea, that there is something in the art of steelmaking that is deeper, more important than the scientific control, something learned by experience by men in close touch with methods. These men are not articulate and find difficulty in meeting on a common ground the scientific investigators who have an exact vocabulary and express themselves with ease.

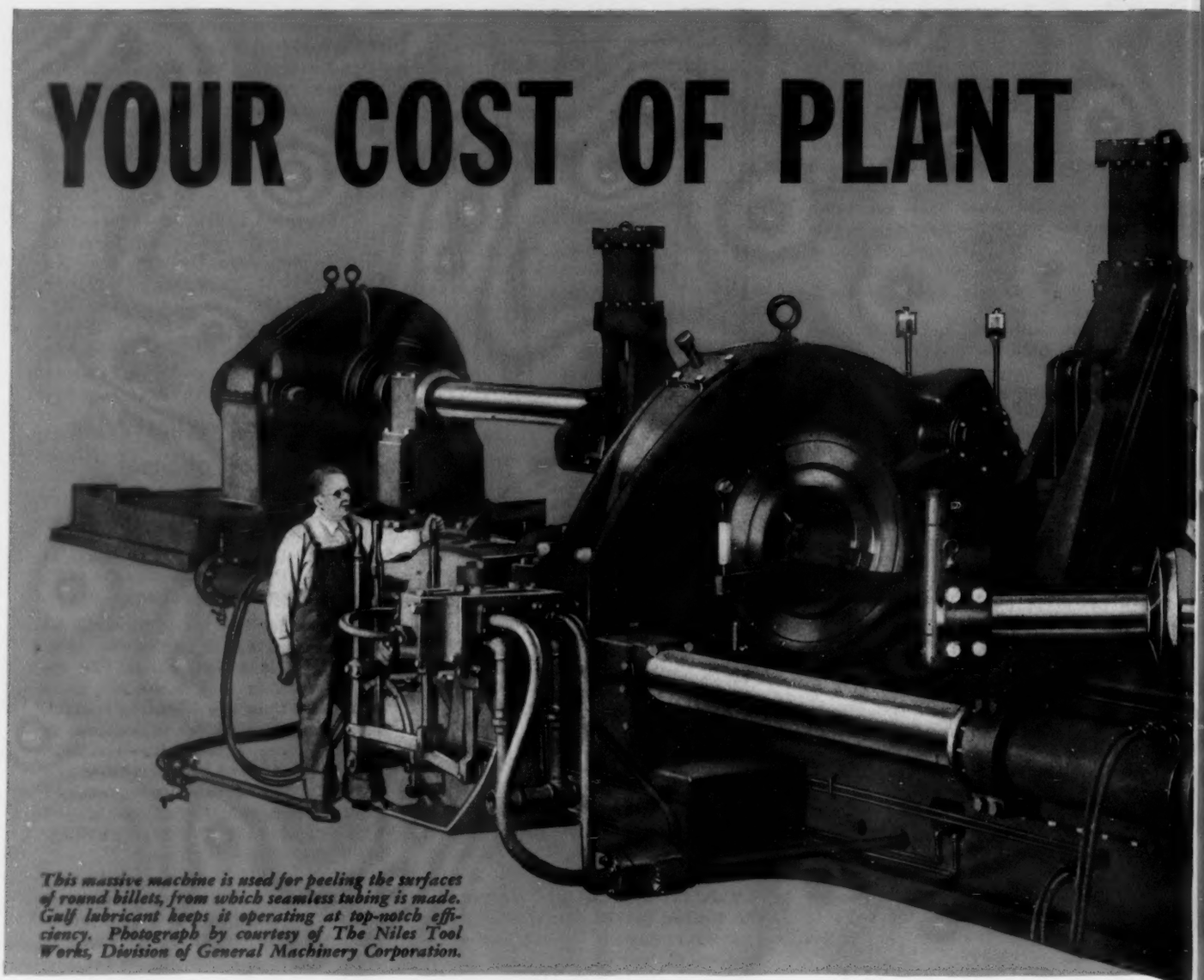
He says: "If 'rule of thumb' may be taken to include experience, judgment and the ill-defined and unexplainable which guides a workmen in producing results, then its replacement by scientific control may be regarded as an improvement when it produces equally good results. . . . Prejudice! say most of my scientific friends. Exactly. I have made an opportunity to air my prejudices, if that is what they choose to call my preferences, and if, after all, they disagree, I beg them to remember that 'as iron sharpeneth iron, so sharpeneth the countenance of a man that of his friend.'"

The point of view of the author is refreshing and whether the reader agrees or disagrees there is food for thought in his attitude and his arguments.

New Liquid Rust Remover

A new liquid rust removal compound is being manufactured by the Rusticide Products Co., 1956 East Nineteenth street, Cleveland. Known as Rust-I-Cide, it is used before repainting rusted metal and for cleaning up bright metal on which rust spots have formed. The material is claimed to be quick acting, nonpoisonous and harmless to the hands.

YOUR COST OF PLANT



This massive machine is used for peeling the surfaces of round billets, from which seamless tubing is made. Gulf lubricant keeps it operating at top-notch efficiency. Photograph by courtesy of The Niles Tool Works, Division of General Machinery Corporation.

Avoid needless wear and repairs . . . . prolong the life and conserve your investment in expensive machines like this

NEW operating economies must meet today's conditions in American industry! Former yardsticks of efficiency in plant operation fail to meet present day demands.

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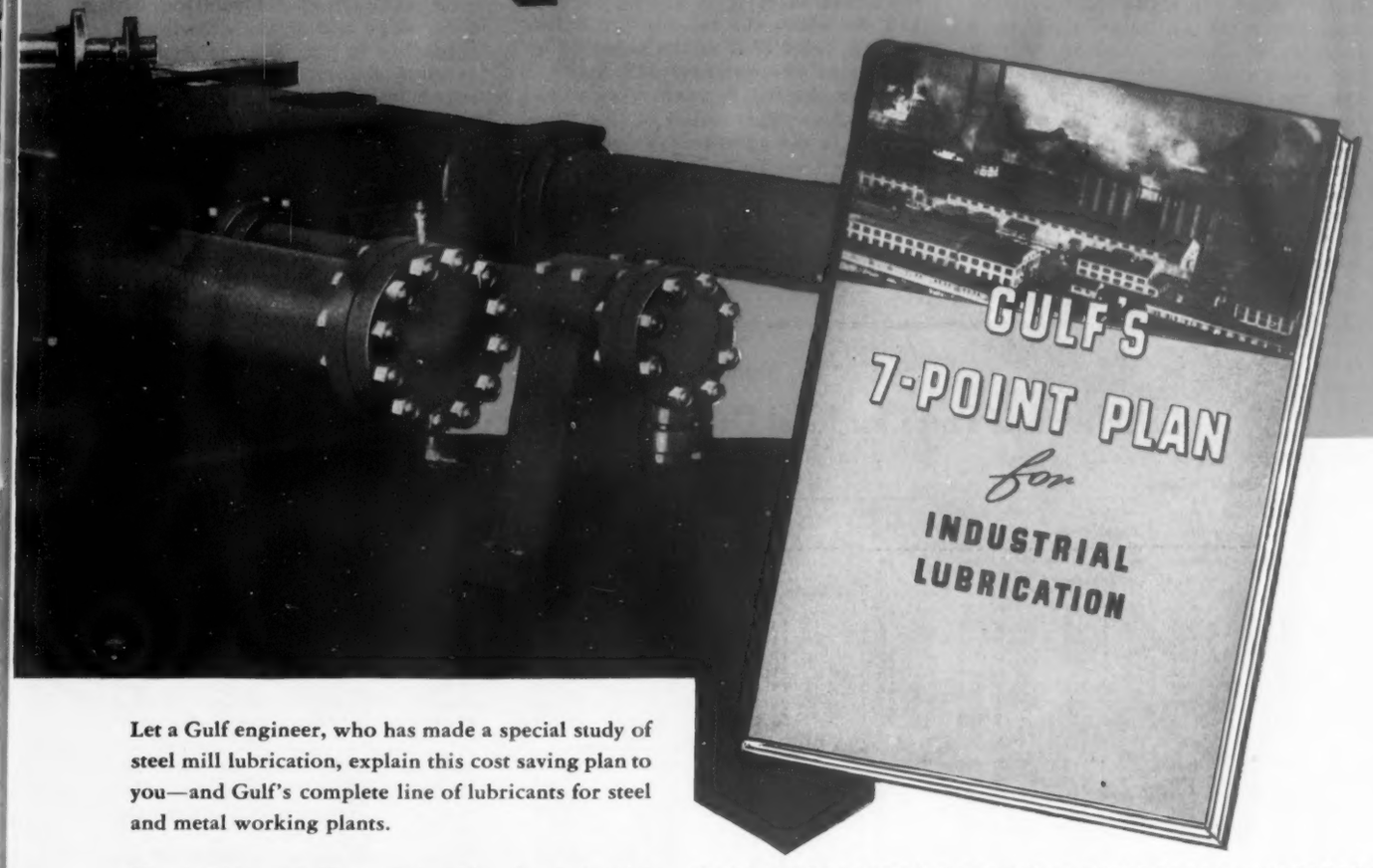

Let a Gulf engineer, who has made a special study of steel mill lubrication, explain this cost saving plan to you—and Gulf's complete line of lubricants for steel and metal working plants.

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The Plastic Forming Of Metals

By PROFESSOR DR.-ING. ERICH SIEBEL
Translated by JOHN H. HITCHCOCK

Part II—Forces and Flow of Material in Technical Forming Processes

8. Force Relations in Deep Drawing (Continued)

CALCULATING the theoretical variation of the drawing force as well as the work of deformation for the ideal drawing process, requires flow curves for both materials; that is, the deformation strength must be established as a function of the deformation. Within the range of uniform elongation, this determination was made by a tensile test, in which the stresses were referred to the actual area of cross section (true stresses). For deformations exceeding 20 per cent, the sheet was rolled in several passes in a cold rolling mill, and the tensile strength was observed after each stage of deformation. The values of strength determined in this way were equated to the deformation strength in the deformation in question. The flow curve thus obtained for sheet steel A is shown in Fig. 113, in which the momentary deformation, calculated as the natural logarithm of the quotient of initial and final dimensions, is again used as abscissa. Also represented in this illustration is the specific work of deformation $a = \int_0^{\phi} k_f \times d\phi$ for both materials calculated from flow curves.

The variation of the drawing force for ideal deformation, calculated with the help of these flow curves for sheets of steel, A, 0.039-inch thick and for blank diameters of 2.36, 2.76, and 3.15 inches is shown in Table XII for the deep drawing of cups having an inside diameter of 1.57 inches. Column 1 indicates the actual travel of the punch; column 2 shows the displacement at the drawing edge, determined according to equation (61); column 3 indicates the momentary radius at the edge of the blank, according to equation (57); and column 4 shows the original radius of portion within the drawing edge, according to equation (59).

Deformations Are Shown

In columns 6 and 7, calculated from these dimensions, are shown the deformations at the outer edge and at the drawing edge, and the deformation which each element undergoes during the displacement from the outer edge to the drawing edge. Columns 8 to 10 contain the strength values, corresponding to the momentary condition of deformation, at the outer edge and at the drawing edge, according to Fig. 113; as well as the average deformation strength computed from these values. In column 11, finally, the radial stress at the drawing edge is calculated as the product of columns 7 and 10, according to equation (55b); and column 12 contains the theoretical drawing force, according to equation (56). The drawing forces for both sorts of

Table XII

Calculation of Force for Ideal Deep-Drawing with Sheet Steel A*

1	2	3	4	5	6	7	8	9	10	11	12
Movement of die h	Displacement at drawing edge h′	Radius outside—R	Original radius—X_0	Deformations $\log_e \frac{R_0}{R}$	Deformations $\log_e \frac{X_0}{r}$	Deformations $\log_e \frac{R}{r}$	Deformation strength from Fig. 113, At outer edge	Deformation strength from Fig. 113, At drawing edge	Deformation strength from Fig. 113, At center	Theoretical drawing stress—σ_r	Theoretical drawing force $P = 2\pi rs.\sigma_r$
inches	inches	inches	inches	%	%	%		pounds/sq. in.		lbs./sq. in.	pounds
Disk Diameter: $D = 2R_0 = 2.361$ inches											
0	0	1.180	0.807	0	0	38.1	26,310	26,310	26,310	(0)	(0)
0.276	0.090	1.118	0.893	5.1	10.2	31.9	35,290	44,100	39,800	12,660	2523
0.315	0.130	1.086	0.925	8.4	13.7	29.7	41,270	48,380	44,810	13,300	2646
0.354	0.169	1.059	0.960	10.8	17.4	27.2	44,810	52,500	48,660	13,220	2633
0.394	0.209	1.027	0.992	13.6	21.0	24.5	48,380	55,500	51,930	12,730	2535
0.433	0.248	0.996	1.023	17.0	23.8	21.0	51,930	57,900	54,920	11,520	2292
0.472	0.287	0.964	1.055	20.3	26.8	17.8	55,050	60,460	52,780	10,240	2039
0.779	....	0.807	1.180	38.1	38.1	0	56,900	56,900	56,900	0	0
Disk Diameter, $D = 2R_0 = 2.756$ inches											
0	0	1.378	0.807	0	0	53.5	26,310	26,310	26,310	(0)	(0)
0.315	0.130	1.299	0.925	5.9	13.7	47.6	37,000	48,380	42,690	20,190	4037
0.394	0.209	1.251	0.992	9.6	21.0	43.9	43,400	55,500	49,500	21,760	4367
0.472	0.287	1.196	1.054	14.1	26.8	39.4	49,090	60,460	54,780	21,610	4322
0.551	0.366	1.149	1.114	18.9	32.2	34.6	54,070	64,020	59,050	20,480	4101
0.630	0.445	1.086	1.169	23.8	37.1	29.7	58,330	66,170	62,300	18,490	3704
0.708	0.523	1.027	1.220	29.4	41.4	24.1	61,900	68,720	65,300	15,790	3152
0.787	0.602	0.964	1.275	35.7	45.8	17.8	65,750	70,860	68,300	12,230	2448
1.09	....	0.807	1.378	53.5	53.5	0	74,000	74,000	74,000	0	0
Disk Diameter: $D = 2R_0 = 3.149$ inches											
0	0	1.574	0.807	0	0	66.8	26,310	26,310	26,310	(0)	(0)
0.315	0.030	1.507	0.925	4.3	13.7	62.5	33,430	48,380	40,830	25,460	5072
0.394	0.209	1.464	0.99	7.2	21.0	59.6	39,550	55,500	47,510	28,300	5645
0.472	0.287	1.421	1.054	10.2	26.8	56.5	44,100	60,480	52,200	29,430	5890
0.551	0.366	1.374	1.114	13.6	32.2	53.2	48,380	64,030	56,200	29,870	5956
0.630	0.445	1.326	1.169	17.1	37.1	49.7	52,070	66,300	59,180	29,430	5890
0.708	0.523	1.279	1.220	20.7	41.4	46.0	55,500	68,590	62,030	28,440	5690
0.787	0.602	1.228	1.275	24.8	45.8	42.0	53,600	70,860	64,750	27,170	5425
0.866	0.681	1.173	1.322	29.4	49.4	37.5	61,900	72,300	67,000	25,180	5128
0.944	0.760	1.118	1.370	34.2	52.9	32.6	64,750	74,000	69,300	22,610	4520
1.023	0.838	1.059	1.417	39.6	56.3	27.2	67,720	75,400	71,580	19,480	3903
1.101	0.917	1.000	1.460	45.4	59.3	21.4	70,720	76,400	73,580	15,790	3153
1.456	....	0.807	1.574	66.8	66.8	0	79,000	79,000	79,000	0	0

*Sheet thickness $s = 0.039$ inch. Drawing diameter $d = 2r = 1.614$ inches

sheets, determined in this way, are plotted in Fig. 114 against the travel of the punch as abscissa (force-travel diagram). At the beginning and end of the drawing process, the simple relation between the travel of the punch and the displacement at the drawing edge, according to equation (61), is not valid. A linear increase or decrease of the drawing forces from or to a value of zero, as shown by dotted lines, as assumed in these regions.

In addition, the energy requirement for the ideal (frictionless) drawing process for sheet steel, A, was determined in Table XIII, according to equation (62), for sheets of 0.039-inch thickness and having various initial diameters, assuming a constant area of the sheet. The deformation $\log_e \frac{x}{r}$, and the specific work of deformation, a, pertaining thereto, were determined for increasing values of the radius, x, according to Fig. 113. The integral $\int_r^x x\,a\,dx$ then could be calculated from the product, $x \times a$, and by multiplying this product by $2\pi s$, the work of deformation of the deep draw was obtained. The extraordinarily large increase of the theoretical work of deformation with increasing blank diameter is clearly shown. As Fig. 114 indicates, this may be attributed in part to the increasing drawing force, and in part to the lengthening of the stroke of the punch.

As a result of the described increase of the drawing force, the depth of draw, which can be reached in a single operation, is limited; because the cup becomes torn apart at the base, or in the lower part of the jacket, as soon as the drawing force exceeds the value $2\pi r \times s \times K_z$ (K_z = tensile strength). Because of the forming losses, this limit is reached practically in most materials with a ratio of blank diameter to that of the drawn cup of less than 2. In sheet steel, A, having a tensile strength of about 44,100 pounds per square inch, this rupture limit for a sheet of 0.039-inch thickness and with an average drawing diameter of 1.61 inch, lies at a drawing force of about 8820 pounds. As Fig. 111 shows, this limit already was reached in the drawing tests with a blank diameter of 3.15 inches corresponding to a ratio R_0/r of 1.95. Disks of 0.02-inch and 0.39-inch thickness, however, still could be drawn, whereas the sheets 0.079-inch thick started to tear. With steel B, blanks of 3.15 inches diameter no longer could be drawn without pronounced formation of wrinkles at the edge or rupture at the base.

A comparison of the curves derived from tests with those determined for ideal deformation, as shown in Fig. 114, indicates extensive agreement between the curve groups. The peaks of the calculated curves and of the test curves lie at nearly the same section. The curves for blank radii of 1.18, 1.38 and 1.57 inches show the same changes of slope at the sides. Because of the

Table XIII

Calculation of Theoretical Work of Deformation in Deep Drawing Sheet Steel A*

Radius—x	Deformation $\log_e \frac{x}{r}$	Specific work of deformation a	Calculation of work of deformation for s = 0.039 in.		
			x-a	$\int_r^x x\,a\,dx$	$2\pi s \int_r^x x\,a\,dx$
inches	%	lbs./sq. in.	pounds		foot pounds
0.807	0	0	0	0	0
0.944	15.7	5,480	5,170	355	.....
1.023	23.7	10,240	10,470	970	.....
1.101	31.1	14,930	16,440	2,030	.....
1.180	38.0	19,560	23,100	3,590	74.07
1.259	44.5	23,980	30,190	5,700	.....
1.338	50.5	28,230	37,790	8,373	.....
1.377	53.4	30,450	41,930	9,945	203.9
1.416	56.3	32,590	46,150	11,680	.....
1.495	61.7	36,700	54,900	15,660	.....
1.574	66.8	40,700	64,000	20,330	418.7

*Sheet thickness s = 0.039-inch. Drawing diameter d = 2r = 1.614 inches.

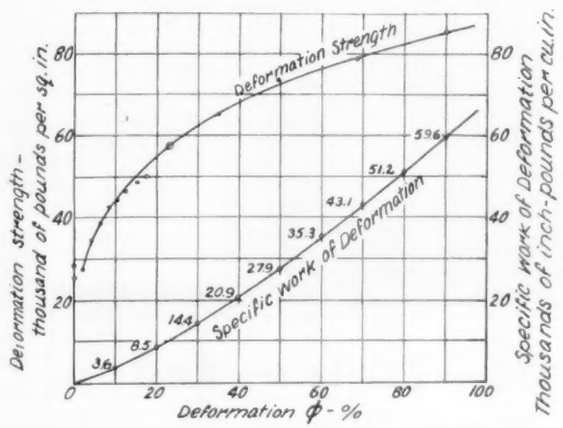

Fig. 113—Flow curve and specific work of deformation for steel A

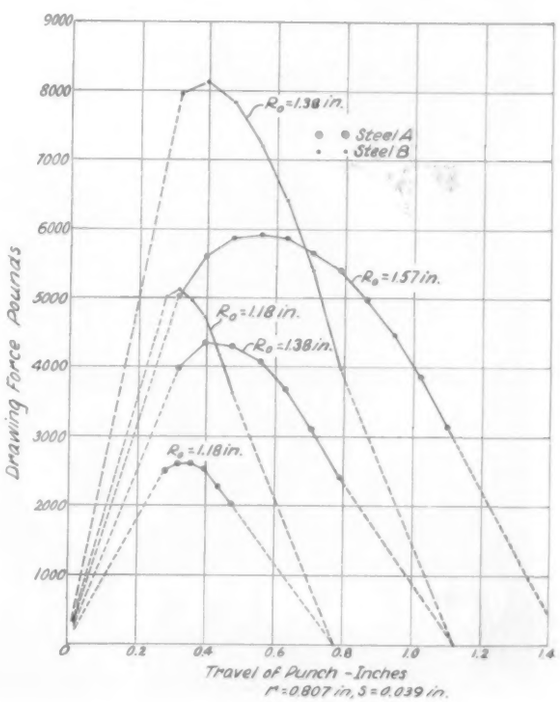

Fig. 114—Theoretical variation of drawing force ($r = 0.807$-inch, $s = 0.039$-inch)

Steel—*Tailor-Made* For You

GRANITE City Sheets and Plates can help you secure superior results in your finished fabricating jobs because they're "tailor-made" *for quantity order.*

The actual ingots from which your stock is rolled are made from steel of a special analysis, exactly as you indicated in your specifications. Unusual—yes. But possible because at Granite City, the open hearth is a definite part of the plant. Your steel, on quantity order, is made for you from "heat to sheet."

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STEEL SHEETS
PLATES AND
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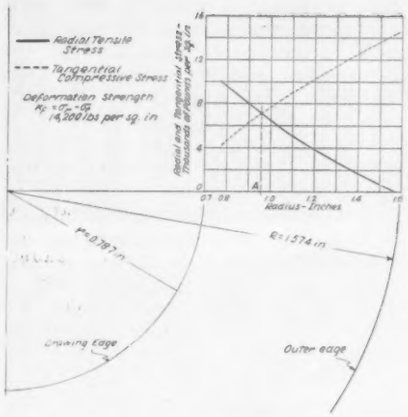


Fig. 115—Stress distribution in frictionless deep drawing

losses, however, the drawing forces and the work of drawing determined in the tests are considerably higher than the corresponding values calculated for frictionless deformation. A comparison of the theoretical work of deformation with the actual work of forming, determined by measuring the drawing diagram with a planimeter, can be made in order to calculate the deformation efficiency of the deep-drawing process. The work of drawing required for sheets of steel, A, 0.039-inch thick, with the blank radii investigated, is found according to Fig. 111 to be 152, 380 and 730 foot pounds. From the values of Table XIII, deformation efficiencies of 50, 53 and 57 per cent, respectively, thus are computed. In the harder steel B, the work of drawing with blanks of 1.18 and 1.38 inch radius is found from Fig. 112 to be 242 and 600 foot pounds. The deformation efficiency correspondingly is determined as 60 and 64 per cent.

The quotient of the theoretical and actual maximum loads is larger in all cases than the corresponding deformation efficiency. In steel A, for the blank dimensions investigated, values of this quotient were found to be 64, 63 and 66 per cent; while for steel, B, they were 78 and 75 per cent. The difference between the values of deformation efficiency, as calculated from the work of deformation or from the maximum load is explained by an irregularity which is exhibited by the force distribution curves as determined by tests. The drawing force does not fall off uniformly from the point of peak load, as would be expected according to the curves calculated for ideal deformation. Instead, this decrease becomes more gradual toward the end of the deformation process. In the thin sheets, even a subsequent increase of the drawing force appears, which almost reaches the first peak load in the draws with 3.15 inch blank diameter (see Fig. 111). The cause of the described disturbance is the formation of local thickening and wrinkles at the edge of the blank, which become compressed as they enter the space between punch and die. This phenomenon can be understood if the stress distribution which occurs in the blank during deep drawing is investigated more closely.

The stress distribution for a blank of 3.15 inch diameter, calculated according to equation (54), is shown in Fig. 115. For the sake of simplicity, it is assumed that the deformation strength, k_f, is constant at 14,220 pounds per square inch and the frictional forces, as well as the transverse stresses produced by the pressure of the blank holder, are neglected. At the edge of the blank, the radial stress $\sigma_r = 0$, and accordingly, from equation (1), $\sigma_t = -k_f$. Pure compression thus occurs at the edge, and the material displaced during the shortening of the circumference therefore tends to flow out uniformly in the radial direction and in the direction of thickness; or with insufficient pressure of the blank holder, especially in thin sheets, the material tends to yield by means of the formation of wrinkles[84].

Additional Stresses Form

Between the disk edge and the drawing edge, increasing tensile stresses are formed in the radial direction, and diminishing compressive stresses in the tangential direction (see Fig. 115). According to the shear stress theory, therefore, a flow of material should occur only in the plane of the sheet, because the maximum shear stresses act in this plane. According to the investigations described in Part I, section 2, however, a flow of material is expected in the transverse direction; and as long as the tangential compressive stresses are larger than the radial tensile stresses, the sheet undergoes an increase of thickness between the point A and the outer edge, according to equation (10), and a decrease of thickness between the point A and the drawing edge. The assumption made at the beginning that the sheet thickness is constant therefore is strictly valid only for the beginning of the draw. Because of the transverse compressive stresses exerted, and the increase of the radial tensile stresses effected by the friction, which must denote a corresponding diminution of the tangential compressive stresses toward the drawing edge, the pressure of the blank holder produces a displacement of the point, A, toward the outer edge, and consequently an extension of the zone of the drawn material in which a reduction of wall thickness results. An increase of the wall thickness in the portion near the edge always must be reckoned with, so that the area of the drawn material altogether remains nearly unaltered.

The thickening at the edge, or the formation of wrinkles, leads to increased requirement of force at the end of the drawing process, because both phenomena are reversed again in the space between the punch and the die, which causes a large difference between the theoretical and the actual values of force. On the other hand, these processes have the effect of lowering the peak load, because the outer edge moves more rapidly toward the inside, and the radial and tangential stresses at the edge during the formation of wrinkles can be developed only to a limited extent. The difference in deformation efficiency, according to calculation from the work of forming or from the variation of force, is explained sufficiently by these facts.

The deformation efficiency, varying from 50 to 65 per cent throughout, borders closely upon the values established in other sorts of drawing. The similarity between the curves of drawing force determined by tests and those calculated for the frictionless drawing process shows this fact clearly. In any case, the effects of the blank dimensions and of the dimensions of the product, and the influence of the shape of the flow curve for the material used, are probably qualitatively the same in the theoretical and actual drawing diagrams. Especially up to the point of peak load, the same relations probably still exist; whereas the later course of the diagram deviates more widely from the theoretical curves, because of the described phenomena of disturbance*.

The fact that the suitability for drawing of two different metals of equal strength need not be the same is shown by comparison of the theoretical curves of drawing force, reproduced in Fig. 116, for soft steel and α—brass, for a draw from 2.76 inch blank diameter to 1.61 inch cup diameter, with a sheet 0.039-inch thick. Both materials show a tensile strength of 44,100 to 47,000 pounds per square inch. Their flow curves, however, have entirely different shapes, as Fig. 117 shows. For the brass sheet, the highest value of the theoretical drawing force, with the diameter ratio investigated, is about 20 per cent less than that for the

*The last observation confirms the statement made by E. Ruhrmann[79].

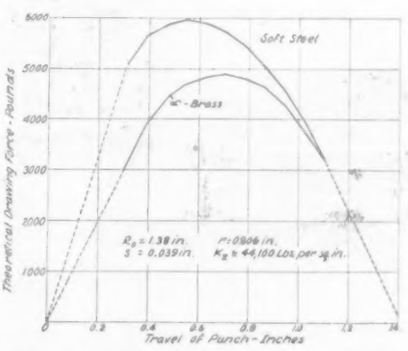

Soft Steel
α - Brass
Theoretical Drawing Force - Pounds
Travel of Punch - Inches
R_0 = 1.38 in.
s = 0.039 in.
r = 0.906 in.
K_f = 44,100 Lbs. per sq. in.

Fig. 116—Comparison of theoretical drawing force for steel and α-brass having same tensile strength

[84] J. W. Geckler: Eine mathematische Untersuchung der Faltenbildung beim Ziehprozess; Z. angew. Math. u. Mech. 8(1928)p.341.

steel sheet. The depth of draw in the brass sheet can be chosen correspondingly greater without danger of rupture, although the difference mentioned also is reduced somewhat with increasing blank diameter. On the other hand, because of the lower elastic limit of brass, severe elongation and increase of area are to be expected during deep drawing, at the base and in the lower part of the cup.

For this reason, the tensile strength alone provides no satisfactory conclusion regarding the suitability of a material for deep drawing. Instead, the ductility of the material, which is considerably higher in brass than in soft steel, is primarily decisive in determining the suitability for deep drawing. According to G. Sachs[85], the materials with very great ductility certainly show the greatest suitability for drawing. Materials in which the ductility is smaller, however, by no means show less suitability for drawing than those of average ductility. In practice, conclusions regarding the suitability of materials for deep drawing usually are found by special test methods; such as depth testing described by Erichsen[86], the deep-draw expanding test[87], and other similar means.

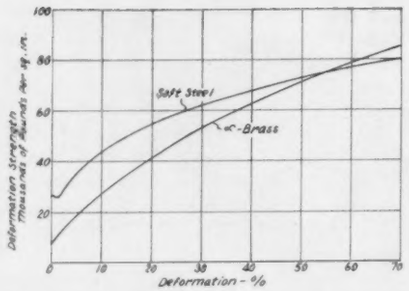


Fig. 117—Flow curves for steel and α-brass having same tensile strength

(To be Continued)

[85] G. Sachs: Spanlose Formung der Tiefziehen, Spanlose Formung der Metalle; J. Springer, Berlin 1931.

[86] A. M. Erichsen: Ein neues Prufverfahren fur Feinbleche; St. u. E. 34 (1914)p.879.

[87] E. Siebel and A. Pomp: Die Prufung von Feinblechen durch den Tiefzieh-Weitungsversuch; Mitt. K. W. Inst. Eisenforsch. 12(1930)p.115.

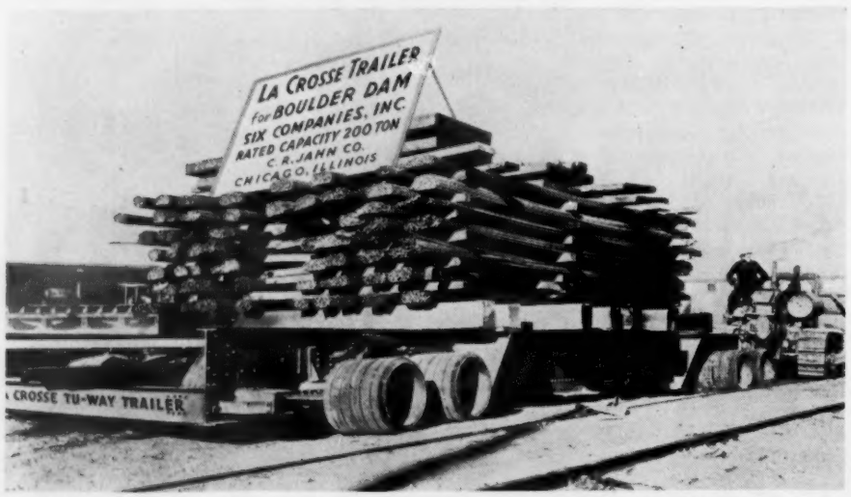
Builds Unusually Large Trailer To Handle Boulder Dam Penstock Pipe

ONE of the major problems confronting engineers on the Boulder dam project has been that of transporting the welded steel penstock pipe from the field fabricating plant to the dam site, a distance of 1½ miles over a road blasted out of the mountain side. When delivered to this point, the pipe is unloaded and lowered by the government cableway to the penstocks hundreds of feet below.

Some of the pipe is the largest ever made, weighs 185 tons and is 30 feet in diameter. It is 2¾ inches thick and made from six plates of steel which are so heavy that three of them make a load for one flat car from mill to fabricating plant.

To meet this unusual transportation problem, a giant trailer was built and the equipment has just been pronounced satisfactory by government and Six Companies Inc. engineers after completion of a severe test at Boulder City.

This trailer, sold by the C. R. Jahn Co., Chicago, and built by the La Crosse Boiler Co., La Crosse, Wis., is understood to be the largest ever built. The accompanying illustration shows it as it was loaded during test. The unit is 37 feet 8 inches long and 22 feet wide and has a frame of fabricated steel built up on two 33-inch beams. It is mounted on 16 wheels supported by eight axles, each axle carrying two wheels and two tires to the wheel, making thirty-two 28 x 14-inch tires. Axles are of the tilting, oscillating type to care for road irregularities and assure a level platform and balanced load.



This steel trailer, weighing 41 tons and equipped with 16 double-tired wheels, will be used at Boulder dam to transport the massive sections of welded penstock pipe from the field fabricating plant to the dam site. In test, the trailer was loaded with 194 tons of reinforcing bars as shown here

Power Steering Required

All 16 wheels are steered by hydraulic pressure furnished by a pump driven by a 15-horsepower motor. Control is provided by a steering wheel on a platform at one end of the trailer. A compensating link between the two main steering levers makes it possible to steer the wheels on the inner arc of a curve at an angle suitable to the angle of the wheels on the outer arc and assure a rolling action to all 16 wheels.

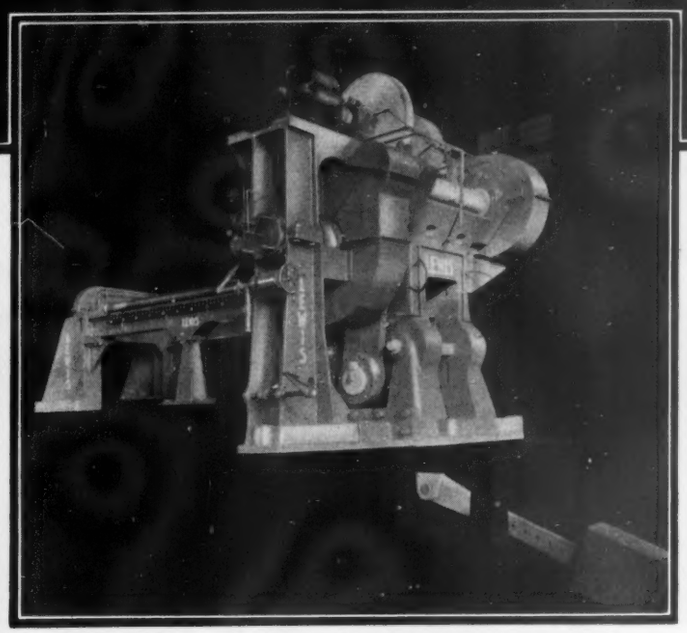
Air brakes, of the internal expansion type, give instant control. Safety features provide for application of the brakes should the hauling unit be disconnected. The air compressor delivers a maximum pressure of 200 pounds to each of four storage chambers at the four corners of the frame. Hauling may be done from either end and drawbars are provided. Thus, the trailer does not need to be turned around at the end of the trip.

The test of the unit consisted of loading it with bundles of steel reinforcing rods averaging two hundred ⅝-inch rods to the bundle. The load was 194 tons not counting the timbers used in piling the steel. The trailer weighs 41 tons, making the gross load almost 235 tons. It was then pulled over a roundabout road to the highway. This necessitated crossing tracks and rough terrain, a feat which amply demonstrated the flexibility and strength of the machine and prompted its acceptance by the engineers.

To Hold Enameling School

Ferro Enamel Corp., 4150 East Fifty-sixth street, Cleveland, will conduct its annual course of study for porcelain enamelers May 3-5 in its plant in Cleveland. The course, open to members of the porcelain enameling, steel and allied industries, will include a series of lectures and classroom discussions.

BALANCED WEIGHT SAVES POWER



On this Upcut Shear we have balanced the dead weight of the knife head and the links which are very heavy, thus saving considerable power when cutting.

LEWIS UPCUT BLOOM SHEAR

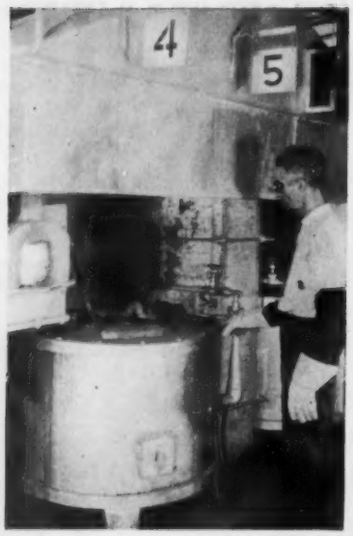
THE LEWIS UPCUT BLOOM SHEAR is built in sizes to cut 7" x 7" to 15" x 15" hot steel blooms. Being self contained, it is driven through cut herringbone gears by motor mounted on top. Shafts mounted in roller bearings are in a straight line to facilitate assembly or removal of any one without disturbing the others. The sliding knife head is balanced by adjustable counterweights located below floor.

Shear is also equipped with motor operated gauge and lift for predetermining the various lengths to be cut and allowing the cut length to pass on.

Illustration shows Shear and Gauge capable of handling 10" x 10" blooms, shearing to lengths varying from 3'0" to 14'0".

LEWIS FOUNDRY & MACHINE CO.
P.O. BOX 1591 PITTSBURGH, PA.

Making the Most of METHODS AND MATERIALS



EXPERIMENTS by leading steel and metal enameling shops to enamel 18-8 steel thus far have been generally unsatisfactory. Enameled tanks of this material, designed for chemical work, have failed because the smooth surface of the steel prevented the enamel from adhering firmly. Expansion of the steel under enameling temperatures has been out of proportion to present practice, resulting in an inferior enamel finish. Recently the transit department, Boston, specified a substantial tonnage of enameled stainless steel for tunnel ceilings, grilles, frames and panels for the interior of the East Boston traffic tunnel, one of the largest inquiries for enameled stainless to come out. The bids finally were rejected as excessive and specifications changed to Muntz metal. Enameled stainless originally was specified to soften light reflections, the noncorrosive advantages of stainless steel being desired. Few enameling shops were anxious to attempt the work with present equipment, following known practices.

$ $ $

In pulverizing coke, hardfaced pulverizing hammers give a life of 7 days as compared with 2 days for manganese steel hammers.

$ $ $

To meet the demand for floodlights of enduring construction, a well-known manufacturer supplies steel units with the entire outside surface finished by cadmium plating. This finish not only prevents rust but provides a silvery-white luster.

$ $ $

A RECENT new use for molybdenum alloy cast iron is in brake drums for cranes. One user already has had twice the life over that of his former steel drums and finds them still in good condition with very little sign of wear. The analysis of the iron used in the drums is: Total carbon 2.90, silicon 1.90, manganese 0.75, sulphur 0.09, phosphorus 0.11 and molybdenum 0.50 per cent.

$ $ $

Through use of the metal spraying process, worn or damaged motor shafts, generator shafts, turbine shafts, crankshafts, pump rods, valve stems, piston rods, axles, calender rolls, lithographing rolls, trolley car motor bearings, and numerous articles have been built up with high-carbon and stainless steel, refinished and put into service at a fraction of their replacement cost. Corrosion-resisting metals have been sprayed on bridges, structural steel buildings, tanks, boats, cooking kettles, bottle washing machines, grate bars, locomotive fire boxes, ash pans, lighting standards, pole hardware, underground metal switchboxes, and the like.

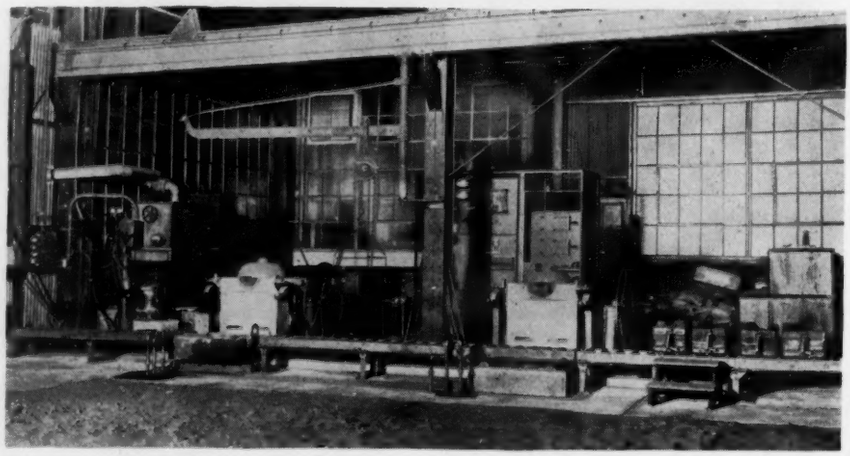
$ $ $

The phenomenon of creep in metals at elevated temperatures has been studied by using single-crystal specimens of extremely pure silver. Pure metal single-crystal specimens have been employed in order to determine creep rates for material in which grain size, grain boundaries and precipitated phases play no part.

$ $ $

A new method for making cores for castings permits the elimination of

Small Castings Poured Direct; Hot Sprues and Gates Are Remelted



THIS unique installation in the steel foundry of the Taylor-Wharton Iron & Steel Co., High Bridge, N. J., is used for direct pouring of small molds brought to the high-frequency induction furnace on the roller conveyor. One 600-pound and one 300-pound furnace, built by the Ajax Electrothermic Corp., Trenton, N. J., are provided, but only one is used at a time.

After pouring, the molds are shaken out at the end of the conveyor, at the extreme left in the illustration, and parts of the gates and sprues while still red hot are thrown back into the furnace. Thus, a large part of the capacity of the furnace is poured into the castings proper instead of one-half or more in sprues and gates.

The Taylor-Wharton company was able to develop this unusual practice because it is possible to keep the power on this type of furnace while it is pouring.

PERSONNEL

THERE is nothing quite so satisfying as the knowledge that your job has been well done. That is the feeling that customers of McClintic-Marshall always have when their orders for structural steel and steel-plate work are completed, because behind McClintic-Marshall construction stands a thoroughly trained organization. From administration to clerk, from engineer to rivet catcher, our personnel are experts at their jobs.

Our men take pride in their craftsmanship. Their skill, acquired through long working with steel in the various shops of McClintic-Marshall, has become a heritage passed from father to son. We, too, take pride in the craftsmanship of our workmen. Even in the lean years our organization is carefully maintained, so that there is always a competent staff to take care of your requirements. There is never any letdown in the high standard of McClintic-Marshall's fabrication and construction.

No matter what your structural steel or steel-plate requirements may be, the knowledge that your work will be placed in the care of McClintic-Marshall is in itself an assurance of the perfection of your project.

McCLINTIC-MARSHALL CORPORATION
Subsidiary of Bethlehem Steel Corporation
General Offices: Bethlehem, Pa.

BETHLEHEM STEEL

McClintic-Marshall

reinforcing wires. Intricate cores, such as for automobile engine manifolds, are being made by some foundries without the use of wires or vents.

$ $ $

In the mining industry where abrasive action is particularly severe, an interesting application of hardfacing has been developed. This is the facing of such parts as undercutter bits. Exhaustive tests have been run in many mines during the past year with the result that many large mining companies have standardized on the use of hardsurfaced bits.

$ $ $

A Canadian railroad is replacing worn bronze locomotive whistle valve seats with new monel metal seats machined from bar stock. These seats resist both the corrosive and erosive action of the steam, thus preventing "white feather" losses.

$ $ $

A recent patent obtained for the manufacture of cast-iron safety treads faced with abrasive material includes the use of a comparatively low melting compound which is applied to the mold face, a layer of abrasive, and another layer of the low melting compound. The mold is arranged so that the molten metal flows across the upper layer mentioned. The low melting substance may be aluminum chloride, potassium alum, chrome potassium alum, ammonium sesquicarbonate, sodium tetraborate, or borax.

$ $ $

Because rollers and grinders used by a large manufacturer of linoleum come in contact with calcium chloride brine, these items are made of monel metal tubing which withstands the corrosive action encountered.

$ $ $

The problem of selecting a correct cutting oil is primarily one of choosing an economical, noninfectious oil that will have a proper balance between its lubricating and cooling properties. Straight mineral oils, though excellent coolants, are claimed to be not suitable as cutting oils for most operations. Fatty oils, such as lard and vegetable oils, though splendid lubricants, are poor coolants; moreover, they are costly.

$ $ $

In a recent riveting job, the rivets were heated by oxyacetylene. A small portable pot had been improvised by welding onto a 4½-inch length of 6-inch pipe a bottom and three 12-inch legs made of ½-inch concrete reinforcing bars. A ¼-inch welding rod was bent and used as a handle. Rivets to be heated were thrown into the pot and the welding torch flame played on them, care being taken to diffuse the heat to avoid burning. The pot was moved around and used at the point where the rivets were to be driven.

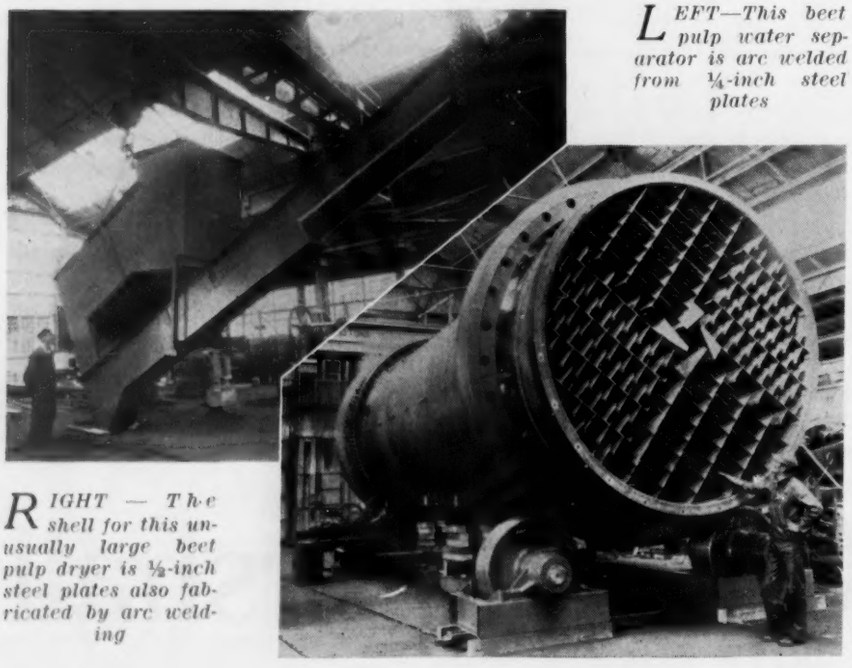
Equipment for Beet Sugar Industry Is Fabricated by Arc Welding

IN ADDITION to building mining and oil refinery machinery, the Stearns-Roger Mfg. Co., Denver, manufactures considerable equipment for the beet sugar industry. Recently, this company completed the fabrication of a 75-ton beet pulp dryer, one of the largest ever built, and a large water separator for a beet sugar company.

Both of these equipments, which are shown in the accompanying illustrations, were constructed by means of electric arc welding with electrodes furnished by the General Electric Co., Schenectady, N. Y.

The beet pulp dryer, with auxiliary equipment, is capable of drying pulp from about 2000 tons of beets in 24 hours, evaporating approximately 430 tons of water in this time and consuming nearly 1,500,000 cubic feet of natural gas. In this process, it produces about 2000 bags of dried beet pulp weighing 100 pounds each. The machine is 44 feet long and about 10 feet 6 inches in diameter. The shell is fabricated by arc welding from ½-inch steel plate of standard specification.

The water separator, which is used in conjunction with the pulp dryer, likewise can handle about 2000 tons of wet pulp every 24 hours. This equipment is welded from ¼-inch steel plates.



LEFT—This beet pulp water separator is arc welded from ¼-inch steel plates

RIGHT — The shell for this unusually large beet pulp dryer is ½-inch steel plates also fabricated by arc welding

Hard Surface Provided by New Welding Electrode

A shielded arc electrode, said to deposit metal of exceptional hardness in building up steel surfaces to resist shock and abrasion, is announced by Lincoln Electric Co., Cleveland. This electrode, designated "Wearweld," deposits air hardening alloy steel and, according to the manufacturer, can be used to build up all steels other than those of the austenitic type.

Hardness of the deposited metal depends to some extent upon the composition of the base metal. On mild steel a single layer is claimed to have a hardness of 40-45 Rockwell C; additional layers, 48-52 Rockwell C. On 0.70 per cent carbon steel, a single layer will have a hardness of 50-55 Rockwell C.

The heavy coating of this electrode provides a shielded arc allowing the transfer of molten metal to take place under non-oxidizing conditions. It also provides a layer of slag of which further protects the metal from the harmful effects of the air and causes the weld metal to solidify in a smooth uniform bead. The finished deposit may be ground to size if shaping is necessary.

MONEL METAL PICKLING CONVEYOR

Operates 3 years

in HOT SULPHURIC ACID

●

THERE'S an interesting pickling conveyor at the Pressed Steel Tank Co., Milwaukee.

It conveys steel shells through a 110 foot bath of hot sulphuric acid. The biggest shells it handles—29" in diameter by 70" long—travel at the rate of 100 an hour. The smallest—6" diameter by 16" long—at 400 per hour.

This conveyor has been in continuous operation for 3 years. But the hot acid hasn't even begun to eat into its Monel Metal parts yet. It's good for many more years.

More thorough cleaning

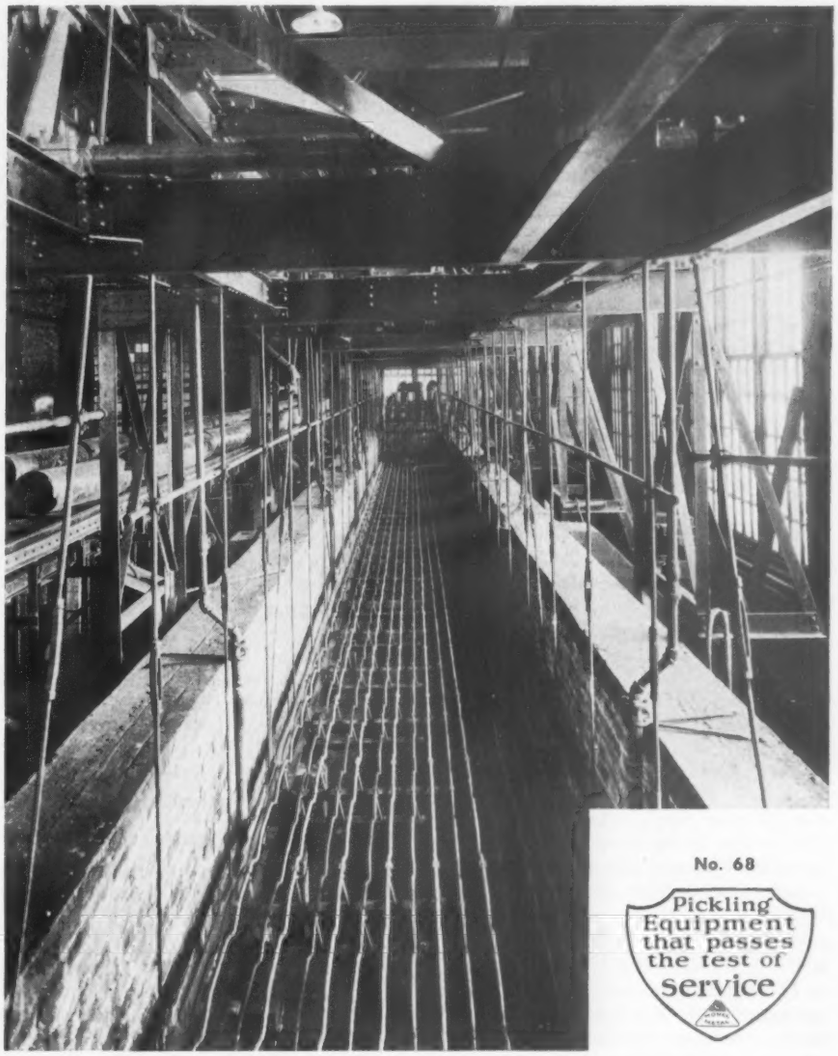
While Monel's stubborn resistance to corrosion assures long life for the equipment, its chemical stability assures a more thorough cleaning job for the product being handled.

For there is no chemical action between Monel Metal and the product, or vice versa, to prevent the acid or alkaline bath from stripping away every scrap of dirt, scale and deposit . . . from leaving a perfect finishing surface.

Saves repairs, replacements, rejects

The improved quality of output, the savings in rejects, and the savings from repairs and replacements made unnecessary by Monel's steel-like strength and long life, explain clearly why Monel Metal is rapidly becoming the standard material for constructing pickling equipment . . . conveyors, baskets, racks, crates, chains, tie-rods.

In case after case, Monel Metal pickling equipment has made an outstanding record under the severest conditions. Just drop us a line and we shall be happy to tell you about them.



No. 68

Pickling Equipment that passes the test of service

● *Continuous pickling conveyor designed and constructed for Pressed Steel Tank Co., Milwaukee, by C. O. Bartlett & Snow Co., Cleveland. All metal parts of reciprocating mechanism submerged in the acid bath of this 110 ft. Basolit tank are constructed of rolled Monel Metal rods, flats, angles, and channels. This photo taken after 3 years' continuous service confirms the owner's report of perfect condition. (Photo by courtesy of Nukem Products Corporation, Buffalo.)*

THE INTERNATIONAL NICKEL CO., INC., 67 Wall Street, New York, N. Y.

Monel Metal

Monel Metal is a registered trade-mark applied to an alloy containing approximately two-thirds Nickel and one-third copper. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

Consumers Will Insist Upon Standards in NRA Codes

CHARGING that industry has paid little attention to the inclusion of standards in the codes adopted under NRA, Dr. Robert. A. Brady, special adviser on consumers' standards, NRA, declares that consumers must gang up for protection. This was the challenge thrown out before members of the American Society for Testing Materials convening at the Wardman Park hotel, Washington, March 5-9, for their 1934 spring regional meeting and their spring group committee meetings.

As a basis for his indictment, Dr. Brady stated that only 70 codes contain provisions involving standards. These manufacturers have written in sections dealing with covert price fixing or quality lowering. The NRA consumers' advisory board, continued the speaker, will offer a standard clause demanding all code authorities to appoint a committee with consumer and government representatives to report in one month and within one year to establish standards of quality, dimensions and labeling.

To Curb Misrepresentation

The consumers' board, said Dr. Brady, will reserve the right of judgment of long established standards of the American Standards association and the American Society for Testing Materials. The plan of the board is to curb deliberate and malicious misrepresentation by manufacturers. The consumers' board now is establishing consumers' councils on a county basis to receive complaints along these lines.

In connection with the board's program, the A.S.T.M. was asked to devise simple testing methods and check tests capable of being applied in high school and college laboratories.

Dr. Brady spoke at a dinner meeting on March 7 at which Willard T. Chevalier, *Engineering News Record*, New York, presided. Addresses also were presented by Lawrence W. Robert Jr., assistant secretary of the treasury; Capt. C. A. Jones, bureau of engineering, navy department; and Col. Henry M. Waite, deputy administrator, federal emergency administration of public works.

More than 450 members of the A.S.T.M. attended the five-day assembly of various committees. In common with its practice for such assemblages, a program of papers was arranged for the session on March 7, the meeting taking the form of a symposium on outdoor weathering of metals and metallic coatings. The week's record of more than 130 separate conferences of committees and subcommittees covered the discussion of specifications, tests and inspection of material ranging from rubber and concrete to practically all types of metals and metallic structures.

A general review of outdoor test results on bare and metal coated ferrous specimens was presented by C. D. Hocker, Bell Telephone Laboratories, New York, in opening the symposium. The speaker reported his personal observations as to results without attempting a theoretical consideration of the causes involved.

In more than 20 years since tests were started on the outdoor exposure of sheets, some exceedingly interesting facts have been developed, stated Mr. Hocker. His observation holds that a copper content up to 0.15 per cent improves corrosion resistance in atmosphere, but not under water. This effect is more marked on bessemer than open-hearth steel sheets. By strange inference, a difference is noted in specimens immersed in sea water. Those tested at Key West, Fla., showed a higher resistance with increasing amounts of copper, while a less evident influence was found at Portsmouth, N. H.

Compare Coating Qualities

Comparisons between various methods of applying protective coatings of zinc were made. Hot dip ranks first in protective ability; electroplating and sherardizing follow with no clear-cut superiority of one over the other. A greater uniformity in results is found in sheets than on cast materials. Hot-dip aluminum offers a fair measure of protection, greater than lead except in certain industrial atmospheres.

In the same group of papers, a study by R. F. Passano, research engineer, American Rolling Mill Co., Middletown, O., showed that zinc coatings last better than cadmium in localities where observations were made and where the coatings were similar in weight. He presented some observations on galvanized roofing showing the increasing protective effect of increasing weights of coatings. Much damage results from injury to corrugated roofing through abrasion in handling and sweating during storage. Increasing the thickness of the steel sheets seems to give increasing life in greater proportion than the added amount of steel.

In the discussion, it was suggested that increasing the coating probably would be the more economical measure. The life of the base metal at the laps is held by Mr. Passano to be the factor of greatest influence.

G. N. Schramm and E. S. Taylerson, research laboratory, American Sheet & Tin Plate Co., Vandergrift, Pa., offered a joint paper, showing the influence of rainfall and smoky atmosphere on the rate of corrosion of iron and steel. Apparently, there is no relationship between rainfall and rapidity of corrosion, either in industrial or rural atmospheres. However, there is a roughly proportional relationship between rate of destruction and the smoke content of the air, as measured by figures of actual fuel consumption in the industrial area surveyed. The rate of corrosion also is higher in the first year in those specimens exposed during the winter season than in the spring, fall or summer.

Location Is Factor

W. H. Finkeldey, metallurgist, Singmaster & Breyer, New York, pointed to the danger of assumptions based entirely upon short-period tests. The initial corrosion of nonferrous metals slows markedly after the first year or two of exposure, whether measured by loss of weight or by reduction in physical properties. In general the corrosion of nonferrous metals in inland rural atmospheres is too slight to be of importance. It is in industrial regions and along the seaboard that corrosive effects take toll of nonferrous metals. In industrial regions the author favored lead, lead alloys, tin and aluminum bronzes, copper and copper rich alloys, commercial aluminum, aluminum coated duralumin and aluminum-manganese alloys in the order named for their corrosion resistance properties.

In marine atmospheres, the order of resistance was given as follows: Lead, lead alloys, nickel, nickel-copper, bronzes, copper-rich alloys, and commercial copper. In general, all the alloys investigated show a lower resistance to industry than to marine atmosphere.

Centrifuge Gages Strength Of Rock Structures

Conservation of mineral resources is now reported possible through the use of a "centrifuge," as disclosed by Prof. Philip B. Bucky in a report of a joint research for the Engineering foundation and Columbia university, New York. The centrifuge, a stress-measuring machine designed by Prof. Bucky, eliminates risk by predicting exactly the strength of proposed rock structures under or above ground.

NEW EQUIPMENT

PRODUCTION FABRICATION
TREATMENT FINISHING

Pyrometer—Russell Electric Co., 333 West Huron street, Chicago, recently placed on the market a pyrometer which eliminates connection leads and employes heavy gage thermocouples. This results in a total variable external resistance which is so low that its resistance is less than one part in 150 parts of the meter resistance, it is claimed. With the resulting large current flow, the pyrometer is able to employ a substantial rugged movement that will not get out of order easily, together with substantial coil springs that make the meter practically dead-beat, according to the manufacturer. The hexagonal case is so designed that the pyrometer extension leads may be attached to the top, bottom or either side.

• • •

Hydraulic Internal Race Grinder—Landis Tool Co., Waynesboro, Pa., recently brought out a 3½-inch hydraulic internal race grinder with automatic air sizing. The machine, shown herewith, operates automatically when grinding except for loading and unloading. This automatic operation is controlled from the progress of the grinding by the air-sizing device.

At the first step in the process the operator places a ring in the chuck and traverses the grinding wheel into the work. As soon as the wheel reaches grinding position the work starts rotating, the head begins oscillating and the wheel automatically feeds into grinding contact with the race. Hydraulic feed mechanism then comes into play and feeds the wheel at a predetermined roughing rate. When the work is rough ground to within about a thousandth of size, which amount is adjustable, the feed is cut down automatically to a fine finishing rate. If desired, coolant is cut off at this point for a dry finishing operation.

As the race reaches finish size the wheel backs away enough so that it may be removed from the race and oscillation stops. Raceways within limits of less than 0.001-inch may be consistently produced, it is claimed. Chatter-free finish is the result of the use of hydraulic power and the elimination of vibration between the grinding wheel and work by mounting both electric motors low on the bed.

The air sizing device employs a diamond tipped finger which rides lightly on the raceway during the entire grinding operation. Once set, the mechanism requires no attention unless the size of the race being ground is changed. A dial gage on the top of the device is provided to visually indicate the progress of the grinding cycle.

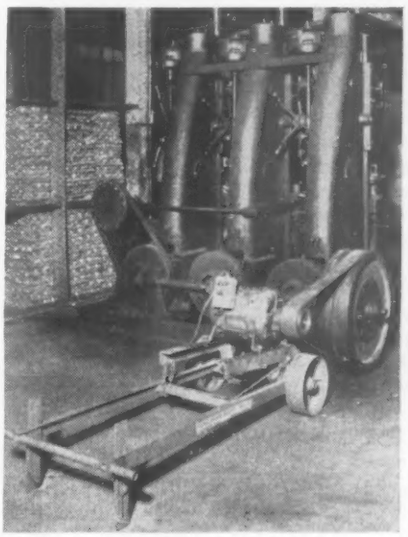
• • •

Belting—Alexander Bros., 406 North Third street, Philadelphia, is marketing a new general utility belt for all regular drives. Special curried high-grade leather with no artificial finish is used. A new method of controlled stretch is included in the process. The belt is made of two plys, each possessing a different degree of elasticity. The outer ply is slightly more elastic than the inner ply, which allows the belt to wrap the pulley with a minimum of internal friction, it is claimed.

• • •

Portable Motor-Drive Truck—Rockwood Mfg. Co., 1801 English avenue, Indianapolis, has placed on the market an industrial truck on which a spare motor is mounted. When a plant motor breaks down or needs repairs the portable unit can be wheeled into position and employed as a temporary drive as shown in the accompanying illustration.

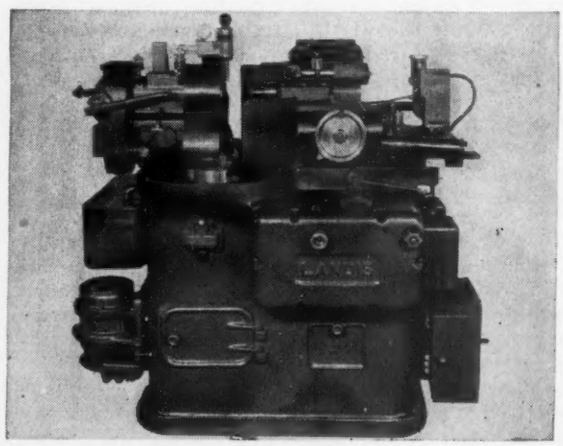
One of the company's standard drives is used, weight of the motor being pivoted so that part of the motor weight automatically maintains tension or tightness in the belt. Units of this type are suitable for all industrial plants using a large number of motors of from 2 to 10 horsepower. In addition to its value to maintenance departments in meeting emergencies, the number of spare motors can be reduced. The truck is a one-man unit. Front and rear stops and stakes assure firm footing so that the truck can be locked into position and will not creep or crawl while the drive is operating.



Rockwood portable drive truck being used to operate gang drill

• • •

Cam Contour Grinder—Norton Co., Worcester, Mass., recently developed a machine that automatically grinds all the cam contours on a camshaft. No attention from the operator is required after loading and starting. The machine is in no sense an attachment for a standard grinder; it is a highly specialized tool for grinding automotive cams on a quantity production basis. With a maximum swing of 6 inches, the unit is built in three standard length taking 30, 36 and 42 inches between centers. Cams with a maximum lift of ¾-inch can be ground and when the wheel slide is withdrawn a 24-inch wheel will clear a



WORKHEAD of this internal race grinder is mounted on two slides, the lower of which is adjustable by a screw for placing the work center the correct distance from the oscillating center to generate the correct race curvature. Upper slide is moved parallel to the work axis by a worm which drives a rack and pinion for centering the groove in the ring

3¼-inch diameter bearing or gear between cams.

♦ ♦ ♦

Lifting Magnet Controller—Ohio Electric Co., 5900 Maurice avenue, Cleveland, is offering a new lifting magnet controller. The unit embodies a choice of lever or pushbutton master magnetic switch for quick drop of load, and indestructible arc shields. An outstanding feature lies in the use of an arc suppressor built into the controller in place of former resistance units to handle the voltage developed when the magnet circuit is opened.

♦ ♦ ♦

Sanding, Polishing Tools—Buckeye Portable Tool Co., Dayton, O., recently placed on the market a sander designated No. 56-4700. The unit operates at 4700 revolutions per minute and is equipped for sanding or grinding with abrasive disks or cup emery wheels. Identical in construction but designed to operate at 1800 revolutions per minute is a new polishing and rubbing tool just announced by the company for rubbing down and polishing lacquer. An effective ventilating system is embodied in the design of these portable tools. The handle is insulated from the body of the unit.

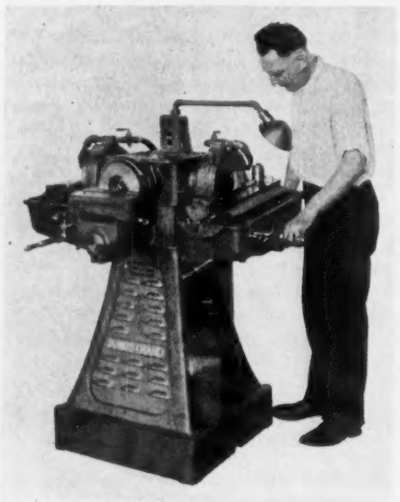
♦ ♦ ♦

Flexible Coupling—Smith & Serrell, 11-A Halsey street, Newark, N. J., and John Waldron Corp., New Brunswick, N. J., have developed an all-steel lubricated gear-type coupling. Torque is carried by lubricated surfaces through solid metal parts from hub to hub. The end plates simply form the dust and moisture-proof enclosure with the center sleeve to contain a supply of oil. Hubs are alike with toothed flanges at their centers, making it possible to turn them end for end and obtain new driving surfaces. The torque rings are two solid steel rings with teeth cut on inside and outside. Fifteen regular sizes are listed for shafts from 1⅞ to 12 inches diameter and with ratings from 22½ to 4840 horsepower per 100 revolutions per minute.

♦ ♦ ♦

Tool Grinder—Sundstrand Machine Tool Co., Rockford, Ill., is building a new 3-wheel tool grinder. It meets modern requirements by grouping three spindles in one machine and providing accurate means for obtaining and maintaining desired angles on cutting tools. All spindles are reversible so that right-hand and left-hand tools can be ground with the wheel or hone turning toward the cutting edge.

This machine, shown in the accompanying illustration, is available with any one of three speed combinations. In one, the speed of one spindle is suitable for grinding high speed steel tools and the speed of the second spindle is suitable for grinding cemented carbides. Each grinding wheel spindle is equipped with a wheel suitable for the material it is to cut. In the second, the speed of both grinding wheel spindles is suitable for grinding tungsten carbides. One grinding wheel spindle has a roughing wheel; the other, a finishing wheel. In the third, the speed of both grinding wheel spindles is suitable for grinding high speed steel. One grinding wheel spindle has a roughing wheel; the other a finishing wheel. The third spindle is



Sundstrand 3-wheel tool grinder has heavy pedestal with large base

equipped with a cast iron disk for honing, and it runs at the same speed in all three of the combinations.

♦ ♦ ♦

Light Source—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has developed a type E light source for use with light-sensitive equipment. It is particularly useful in those applications requiring transmission of a light beam over a considerable distance or in others where the light beam must penetrate steam, dust or similar semi-translucent substances such as encountered in steel mills.

♦ ♦ ♦

Automatic Time Switch—General Electric Co., Schenectady, N. Y., has brought out a companion switch to its type T-13 general purpose automatic time switch. It is for indoor service, has no cover gasket, and is with or without window in the case. The new 30-ampere switch is available in 12 forms, with or without a device for skipping operation on certain days, for either 115 or 230 volts, and for single-pole, single or double-throw, or double-pole, single throw.

Washington

(*Concluded from Page* 15)

system of arbitrarily uniform delivered prices.

"They have fostered discrimination between one buyer and another, and uneconomic cross hauling of goods as well as production at uneconomic points. Since there is such a strong case against them, we believe that devices of this type should be permitted only under peculiarly close scrutiny by the administrator to guard against potential abuses.

"In trying to discover whether existing basing point systems avoid such abuses, we have asked for information about the amounts of product made by each producing center and the points to which this production is distributed. Specifically we have sought this information about the steel and lumber industries. Thus far we have been able to obtain no information sufficiently detailed to determine to what degree the basing points established permit the abuses mentioned."

Transportation

CHIEF of army engineers has recommended to the secretary of war an expenditure of $37,000,000 in improvements to the Beaver and Mahoning rivers, which would open a navigable channel between Pittsburgh and Youngstown, O., and thereby provide water transportation for coke, coal, iron and finished steel.

Maj. Gen. Edward M. Markham, chief of army engineers, who made the recommendation, submitted plans calling for a 12-foot channel from the mouth of the Beaver river to Struthers, O., with a width of 250 feet in the Beaver river and 200 feet in the Mahoning river.

Labor

COMMENTING Thursday on the Weirton Steel Co. case, wherein the national labor board recommended that the department of justice proceed against the Weirton company for refusing to permit its representatives to take a poll of labor at its plants, Attorney-General Cummings said "there will be news about the Weirton case in a few days."

Steel Rate 51 Per Cent, with Markets Strong

Labor Agitation Makes for Cautious Contracting—More Railroad Orders—10,000 Tons in Three Federal Awards—Ingot Output Nearly Double Last Year's

DESPITE increasing labor agitation in automobile centers and at Washington, steel production continues strongly upward, and barring further spread of strikes in the leading consuming industry, steelmakers can see no interruption to steady improvement in demand through the first half of the year.

So far, the uncertainties engendered by this situation have not retarded the flow of specifications on contracts expiring this month, steelworks operations rising 3 points to 51 per cent last week, though they have made consumers more reluctant to contract for the second quarter.

As a result of the NRA code meeting last week, the steel industry itself appears to face with certainty a decrease in working hours of probably 10 per cent, and a compensatory increase of about 11 per cent in wages.

Since present iron and steel prices have not proved remunerative the proposed changes would seem to indicate higher levels. On the other hand, it is believed that in return for further contributions to the relief of unemployment the government will take measures to stimulate consumption of capital goods, in which steel is a component part, and hence there may be a corresponding increase in volume.

Automobile Manufacturers Limiting New Orders to April; Railroad Releases Heavier

Automobile manufacturers are pushing up production as rapidly as possible, expecting this month to establish a new high for the year. Sheet and strip mill output is sustained principally by their specifications, but new purchasing by them is limited almost entirely to material for delivery in April. Strikes in some Michigan plants last week were averted by referring an ultimatum to Washington. Efforts are being made at Cleveland to unionize iron and steel warehouses.

Releases for rails, freight cars and railroad repair material recently purchased are largely responsible for lifting steelworks operations in the Pittsburgh and Chicago districts. Carnegie Steel Co.'s Braddock, Pa., mills this week are to schedule the first of 42,000 tons of rails for the Pennsylvania. Seaboard Air Line has ordered 15,200 tons of rails and fastenings; St. Louis & San Francisco, 18,000 tons of rails.

Loans having been approved, the Chicago, Milwaukee, St. Paul & Pacific is to place shortly 20,000 tons of rails, build 75 passenger coaches and install automobile loading devices in 300 freight cars. Illinois Central is about to purchase 28,333 tons of rails and fastenings; Wabash is inquiring for 10,000 tons of rails.

With seasonal outdoor work approaching, and transfer of CWA activities to PWA April 1, additional construction projects are anticipated which may go far toward relieving labor unrest. Structural awards for the week, 13,735 tons, include 3500 tons for government radio towers in the Canal Zone and Hawaii.

Three thousand tons of concrete reinforcing bars were purchased for Boulder dam, and 3500 tons of welded steel pipe for the Fort Peck, Mont., dam. Further improvement is noted in steel demand for agricultural implements.

Higher Scrap Prices Stimulating Pig Iron Demand; Ingot Production Gain Substantial

Scrap consumption is rising at a more rapid rate, imparting additional strength to prices. Buying at Chicago is the heaviest this year. No. 1 heavy melting steel has sold at $14.50, Pittsburgh, up 25 cents. This situation is stimulating demand for pig iron. A merchant furnace interest at Cleveland has booked 22,000 tons for second quarter; a Chicago malleable foundry has contracted for 5000 tons. STEEL's London cablegram comments on the stronger demand for pig iron in Great Britain.

Steelworks operations last week advanced 14 points to 93 per cent at Detroit; 6 to 50, Chicago; 3 to 82, Cleveland; 3 to 34, Pittsburgh; 1 to 66, New England; 1 to 31, eastern Pennsylvania; and 4 to 56, Youngstown. They were unchanged at 52, both at Buffalo and Birmingham; and down 7 to 70 at Wheeling.

Daily average steel ingot production rose 25.3 per cent last month to 92,696 gross tons, highest since last August. Total output was 2,224,698 tons, compared with 1,996,897 tons in January. Production in the first two months this year—4,221,595 tons—is nearly double that in the corresponding period last year.

STEEL's iron and steel price composite remains $32.40; finished steel, $51.10; while the scrap index is up 8 cents to $12.33.

COMPOSITE MARKET AVERAGES

	March 10	March 3	One Month Ago Feb., 1934	Three Months Ago Dec., 1933	One Year Ago March, 1933	Ten Years Ago March, 1924
Iron and Steel Composite	$32.40	$32.40	$32.42	$32.42	$28.35	$43.24
Finished Steel Composite	51.10	51.10	51.10	51.10	45.60	67.18
Steelworks Scrap Composite	12.33	12.25	11.72	10.12	6.47	16.98

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

	March 10, 1934	Feb. 1934	Dec. 1933	Mar. 1933
Finished Material				
Steel bars, Pittsburgh	1.75	1.75	1.75	1.60
Steel bars, Chicago	1.80	1.80	1.80	1.70
Steel bars, Philadelphia	2.04	2.04	2.04	1.91
Iron bars, Terre Haute, Ind.	1.60	1.60	1.60	1.65
Shapes, Pittsburgh	1.70	1.70	1.70	1.60
Shapes, Philadelphia	1.90	1.90½	1.90½	1.65
Shapes, Chicago	1.75	1.75	1.75	1.70
Tank plates, Pittsburgh	1.70	1.70	1.70	1.60
Tank plates, Philadelphia	1.88	1.88½	1.88½	1.59½
Tank plates, Chicago	1.75	1.75	1.75	1.70
Sheets, No. 10, hot rolled, Pitts.	1.75	1.75	1.75	1.55
Sheets, No. 24, hot ann., Pitts.	2.25	2.25	2.25	2.00
Sheets, No. 24, galvan., Pitts.	2.85	2.85	2.85	2.60
Sheets, No. 10, hot rolled, Gary	1.85	1.85	1.85	1.70
Sheets, No. 24, hot anneal., Gary	2.35	2.35	2.35	2.10
Sheets, No. 24, galvan., Gary	2.95	2.95	2.95	2.70
Plain wire, Pittsburgh	2.20	2.20	2.20	2.10
Tin plate, per base box, Pitts.	5.25	5.25	5.25	4.25
Wire nails, Pittsburgh	2.35	2.35	2.35	1.85
Semifinished Material				
Sheet bars, open-hearth, Youngs.	26.00	26.00	26.00	26.00
Sheet bars, open-hearth, Pitts.	26.00	26.00	26.00	26.00
Billets, open-hearth, Pittsburgh	26.00	26.00	26.00	26.00
Wire rods, Pittsburgh	36.00	36.00	36.00	35.00

	March 10, 1934	Feb. 1934	Dec. 1933	Mar. 1933
Pig Iron				
Besemer, del. Pittsburgh	19.26	19.26	19.26	15.76
Basic, valley	17.00	17.00	17.00	14.00
Basic, eastern, del. eastern Pa.	18.76	18.76	18.76	13.50
No. 2 foundry, del. Pittsburgh	18.76	18.76	18.76	15.76
No. 2 foundry, Chicago	17.50	17.50	17.50	15.50
Southern, No. 2, Birmingham	13.50	13.50	13.50	11.00
No. 2X, Eastern, del. Philadelphia	19.63	19.63	19.63	13.76
Malleable, valley	17.50	17.50	17.50	14.50
Malleable, Chicago	17.50	17.50	17.50	15.50
Lake Superior charcoal, del. Chi.	23.54	23.54	23.54	23.04
Gray forge, del. Pittsburgh	18.38	18.38	18.38	15.63
Ferromanganese, del. Pittsburgh	90.24	90.24	87.24	73.24
Scrap				
Heavy melting steel, Pittsburgh	$14.50	13.90	12.20	8.75
Heavy melting steel, eastern Pa.	11.75	11.75	10.25	6.50
Heavy melting steel, Chicago	12.00	10.90	9.00	5.25
No. 1 wrought, eastern Pa.	12.75	12.75	11.00	6.75
No. 1 wrought, Chicago	10.65	10.50	8.45	5.00
Rails for rolling, Chicago	12.75	11.90	10.35	7.95
Coke				
Connellsville, furnace, ovens	3.50	3.50	3.75	1.75
Connellsville, foundry, ovens	4.25	4.25	4.25	2.25

Steel, Iron, Raw Material and Metals Prices

Prices conform to American Iron and Steel institute schedules. Asterisks denote price changes this week

Sheet Steel

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.75c
Gary, base	1.85c
Chicago, del.	1.88c
New York, del.	2.08c
Philadelphia, del.	2.04c
Birmingham, base	1.90c
St. Louis, del.	2.07c
F.o.b. cars, dock, Pacific ports	2.42½c

HOT ROLLED ANN. No. 24

Pittsburgh, base	2.25c
Gary, base	2.35c
Chicago, del.	2.38c
Detroit, del.	2.45c
New York, del.	2.58c
Philadelphia, del.	2.54c
Birmingham, base	2.40c
St. Louis, del.	2.57c
F.o.b. cars, dock, Pacific ports	2.95c

GALVANIZED No. 24

Pittsburgh, base	2.85c
Gary, base	2.95c
Chicago, del.	2.98c
Philadelphia, del.	3.14c
New York, del.	3.18c
Birmingham, base	3.00c
St. Louis, del.	3.17c
San Francisco, f.o.b. cars, dock	3.55c

TIN MILL BLACK No. 28

Pittsburgh, base	2.65c
Gary, base	2.75c
St. Louis, del.	2.97c

COLD ROLLED No. 10

Pittsburgh, base	2.30c
Gary, base	2.40c
Detroit, delivered	2.50c
Philadelphia, del.	2.59c
New York, del.	2.63c

COLD ROLLED No. 20

Pittsburgh, base	2.75c
Gary, base	2.85c
Detroit, delivered	2.95c
Philadelphia, del.	3.04c
New York, del.	3.08c

ENAMELING SHEETS

Pittsburgh, No. 10	2.45c
Pittsburgh, No. 20	2.90c

Tin and Terne Plate

Per 100-lb. box, Pittsburgh. Gary base, 10 cents higher

Tin plate, coke base contract	$5.25
Do., stock	4.55
Long ternes, No. 24 unassorted	3.25c

Corrosion and Heat Resistant Alloys

Base, Pittsburgh

18% chrome, 8% nickel; sheets, 35c; plates, 28c; bars, 24c; hot-rolled strip, 24.50c; cold-rolled strip, 32.00c.

	A	B	C	D
Bars	17c	18.5c	21c	26c
Plates	20c	21.5c	24c	29c
Sheets	25c	28c	31c	35c
Hot strip	17c	18.5c	21c	26c
Cold strip	22.5c	24c	27c	35c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 19/23% inc., D over 23/30%.

Steel Plates

Pittsburgh, base	1.70c
New York, del.	1.98c
Philadelphia, del.	1.88½c
Boston, del.	2.10c
Buffalo, del.	1.93½c
Chicago, base	1.75c
Cleveland, del.	1.88½c
Birmingham, base	1.85c
Coatesville, base	1.80c
Sparrows Pt., base	1.80c
Pacific Coast, f.o.b. cars, dock	2.25c
St. Louis, del.	1.97c

Structural Shapes

Pittsburgh, base	1.70c
Philadelphia, del.	1.90½c
New York, del.	1.95½c
Boston, del.	2.08½c
Bethlehem, base	1.80c
Chicago, base	1.75c
Cleveland, del.	1.88½c
Buffalo, base	1.80c
Birmingham, base	1.85c
Pacific Coast, f.o.b. cars, dock	2.25c

Bars

SOFT STEEL

Pittsburgh, base	1.75c
Chicago, base	1.80c
Birmingham, base	1.90c
Buffalo, base	1.85c
Cleveland, base	1.80c
Detroit, del.	1.90c
Pacific Coast ports, cars, dock, c.i.f.	2.30c
Philadelphia, del.	2.04c
Boston, del.	2.15c
New York, del.	2.08c
Pitts., forg. qual.	1.75c-2.25c

RAIL STEEL
To Manufacturing Trade

Pittsburgh	1.65c
Chicago	1.70c
Cleveland	1.70c
Gary, Ind.	1.70c
Buffalo	1.75c

IRON

Terre Haute, Ind. base	1.60c
Philadelphia, base	1.74c
Pittsburgh, refined	2.75c-7.50c

REINFORCING

New billet, cut lengths, carlots

Pittsburgh	1.90c
Chicago, Gary, Buffalo, Cleve., Birm., Young	1.95c
Gulf ports	2.30c
Pacific coast ports	2.45c
Philadelphia, del.	2.19c

Rail Steel

Pittsburgh, base	1.75c
Chicago, Buffalo, Cleveland, Birm., Young.	1.80c
Gulf ports	2.15c
Pacific coast ports	2.30c

Wire Products □ □

(Prices apply to straight or mixed carloads; pool cars, or less, 10c up. 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base, Pittsburgh-Cleveland (Per 100-lb. keg)

Standard wire nails	$2.35
Cement coated nails	2.35
Galvanized nails, 15 gage and coarser	4.35c
Do., 16 gage and finer	4.85c

(Per pound)

Polished staples	3.05c
Galvanized fence staples	3.30c
Barbed wire, galv.	2.85c
Annealed fence wire	2.35c
Galvanized fence wire	2.70c
Woven wire fencing (base column, c.l.)	$60.00
Plain wire, 6-9 gage to mfg. trade	2.20c

Anderson, Ind., Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire	3.20c

Chicago and Waukegan $1 higher, Worcester $2 higher.

Cold-Finished Carbon Bars

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	2.10c
20,000 to 59,999 lbs.	2.05c
60,000 to 99,999 lbs.	2.00c
100,000 lbs. and over	1.97½c

Chicago, Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Shafting □ □ □

Turned and ground, Pitts. base

1⅛-inch	3.40c
1 3/16 to 1½-inch	2.90c
1 9/16 to 1 7/8-inch	2.75c
1 15/16 to 2⅞-inch	2.60c
2 1/16 to 7-inch	2.45c

Alloy Steel Bars □

Hot Rolled

Pittsburgh, Buffalo, Chicago, Massillon, Canton	2.45c
Bethlehem	2.55c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 .15 to .25 Mo. 0.50

4600 .20 to .30 Mo. 125-1.75 Ni. 1.05

5100 .80-1.10 Cr. 0.45

5100 Cr. spring base

6100 bars 1.20

6100 spring 0.70

Cr., Ni., Van. 1.50

Carbon van. 0.95

9250 carbon base plus extras

Strip and Hoops □

Hot strip to 23 1/16-in. Pittsburgh	1.75c
Do., Chicago	1.85c
Do., del. Detroit	1.95c
Do., del. Phila.	2.04c
Do., del. N. Y.	2.08c
Cooperage hoop, Pittsburgh	1.85c
Do., Chicago	1.95c
Cold-rolled strip, Pitts., Cleve.	2.40c
Worcester	2.60c

Rails, Track Material □

(Gross Ton)

Standard rails, mill	$36.37½
Relay rails. Pitts. 20-45 lbs.	$26.00
50-60 lbs.	$23.00
70-75 lbs.	$18.00
80-85 lbs.	$25.00
100 lbs.	$26.00
Light rails, billet qual., Pitts., Chi.	$32.00
Do., reroll. qual.	$31.00
Angle bars, mills	2.55c
Spikes, R. R. base	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs., up $2; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons or more; diff. for less.

Bolts and Nuts □ □

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots. Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread	70 off
Rolled thread, ½ x 6 and smaller	70 off

MACHINE BOLTS

All sizes, cut thread, lag Screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts, without nuts	70 off
Tire bolts	60 off
Stove bolts, 70-25-10 off in pkgs.; 83 off in bulk, 5000 or more of a size.	
Rolled thread machine bolts, ½ x 6 and smaller,	70 off
Step bolts	66 off
Elevator bolts	66 off

NUTS

Semifinished	70 off

HEXAGON CAP SCREWS

Milled	80-10-10 off
Upset 1-in., smaller	85 off

SQUARE HEAD SET Screws

Upset, 1-in., smaller	75-10 off
Upset, larger than 1-in.	75-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c.l., Pittsburgh, Cleveland	2.75c
Struc., c.l., Chicago	2.85c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 10 off
Wrought washers, Pitts., Chi., Phila.	6.00-6.25 off

Cut Nails, Piling □

Cut nails, Pitts:; (10% discount on size extras)	$2.75
*Do. less carloads, 5 kegs or more; no discount on size extras	$3.05
*Do., less than 5 kegs; no discount on size extras	$3.20
Steel piling, Pittsburgh	2.00c
Steel piling, Chi., Buff.	2.10c

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

Steel

In.	Blk.	Gal.
¼ and ⅜	57	38½
½	62	50½
¾	65½	55½
1—3	67½	58½

Iron

⅛	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD

Steel

2	63½	54½
2½—3	66½	57½
3½—6	68½	59½
7 and 8	67½	57½
9 and 10	67	57

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½

LINE PIPE

Steel

⅛-inch, butt weld	50½
¼—⅜, butt weld	56
½, butt weld	61
¾, butt weld	64½
1—3, butt weld	66½
2-inch, lap weld	62½
2½—3, lap weld	65½
3½—6, lap weld	67½
7—8, lap weld	66½

Iron

⅛—1½-inch, black and galv. take 4 pts. over; 2½—6-inch 2 pts. over discounts for same sizes, standard pipe lists. 8—12-inch, no extra.

BOILER TUBES

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¾—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 2000 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 pounds, two points under base only.

SEAMLESS BOILER TUBES

Cold Drawn

2—2¼	27	3¼—3½	41
2½—2¾	34	4	43
3	38	4½, 5, 6	36

(On 1—1¾-inch sizes mechanical tubing dis. apply.)

Hot Rolled

2—2¼	33	3¼—3½	47
2½—2¾	40	4	49
3	44	4½, 5, 6	42

Quantity discounts: Carload and more gets preferential of two 5%; 2000 to 9999 pounds, 10 points off base and one 5%; under 2000 pounds, 15 points under base and one 5%.

Seamless Tubing □

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe □

Class B Pipe—Pet Net Ton

6-in., & over, Birm.	$36.00-37.00
4-in., Birm.	39.00-40.00
4-in., Chicago	47.00-48.00
6 to 24-in., Chicago	44.00-45.00
6-in., & over, east. fdy.	40.00
Do., 4-in.	43.00

Class A pipe $3 over Class B. Stnd. fitgs., Birm. base | $90.00

Six to 24-inch, fittings base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, 5 higher.

Semifinished Steel □

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pitts., Chi., Cleve., open-hth. & bess.	$26.00
Philadelphia	31.30
Forgings, Pitts., Chi.	31.00

SHEET BARS

Pitts., Cleve., Young.	26.00
Chicago	26.00
Canton, O.	26.00

SLABS

Pitts., Cleve., Young.	26.00

WIRE RODS

Pitts., Cleveland	36.00
Chicago	37.00

SKELP

All grades, Pitts., and Chicago	1.60c

Coke □ □ □

Price Per Net Ton

BEEHIVE OVENS

Connellsville fur.	$3.50
Connellsville fdry.	4.25
Connel. prem. fdry.	5.00- 5.25
New River fdry.	6.00
Wise county fdry.	4.25- 5.00
Wise county fur.	3.50- 4.25

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.71- 9.31
Chi., ov., outside del.	8.50
Chicago, del	9.25
New England, del.	10.50
St. Louis, del.	9.25
Birmingham, ovens	5.00
Indianapolis, del.	8.75
Ashland, Ky., Connellsville basis	6.00
Portsmouth, ovens, Connellsville basis	6.00
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.00
Philadelphia, del.	9.00

Coke By-Products □

Per gallon, producers' plants. Tank lots

	Spot
Pure benzol	$0.205
90 per cent benzol	$0.205
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26

Per lb. f.o.b. New York

Phenol (200 lb. drums)	0.163c
Do. (100 lb.)	0.178c

Per lb., producers' plants

Naphthalene flakes and balls	6.00- 7.25

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.25

Pig Iron

Delivered prices do not include switching charges except as noted. No. 2 foundry iron is 1.75-2.25 silicon; 25-cent differentials apply for each 0.25 silicon above 2.25. Gross tons.

	No. 2 Fdry.	Malleable	Basic	Bessemer
Basing Points:				
Bethlehem, Pa.	$18.50	$19.00	$18.00	$19.50
Birdsboro, Pa.	18.50	19.00	18.00	19.50
Swedeland, Pa.	18.50	19.00	18.00	19.50
Sparrows Point, Md.	18.50	.....	18.00	.....
From Swedeland, Pa., del. to Philadelphia	19.26	19.76	18.76	.....
From Bethlehem, del. to Brooklyn	20.77	21.27	.....	.....
From Bethlehem, del. to Newark, N. J.	19.99	20.39	.....	.....
Basing Point:				
Everett, Mass.	18.50	19.00	18.00	19.50
From Everett, del. to Boston	19.00	19.50	18.50	20.00
Basing Point:				
Buffalo	17.50	18.00	16.50	18.50
From Buffalo, del. to Boston	19.00	19.50	18.50	20.00
Basing Points:				
Neville Island, Pa.	18.00	18.00	17.00	18.50
Sharpsville, Pa.	17.50	17.50	17.00	18.00
Youngstown, O.	17.50	17.50	17.00	18.00
From Neville Island, Pa., del. to Pittsburgh district	(Neville Island base, plus 63c to $1.13 switching charges)			
Basing Points:				
Erie, Pa.	17.50	18.00	17.00	18.50
Cleveland	17.50	17.50	17.00	18.00
Toledo, O.	17.50	17.50	17.00	18.00
Detroit	17.50	17.50	17.00	18.00
From Detroit, del. to Saginaw, Mich.	19.60	19.60	19.10	20.10
From Cleveland, del. to Akron, Canton, O.	18.76	18.76	18.26	19.26
From Toledo, del. to Mansfield, O.	19.26	19.26	18.76	19.76
Basing Point:				
Jackson, O.	19.25	19.25	18.75	.....
Hamilton, O.	17.50	17.50	17.00	18.00
From Hamilton, del. to Cincinnati	18.51	18.51	18.01	19.01
Do., del. to Indianapolis	19.77	19.77	19.27	20.27
Basing Points:				
Duluth	18.00	18.00	.....	18.50
Chicago	17.50	17.50	17.00	18.00
Granite City, Ill.	17.50	18.00	17.00	.....
From Duluth, del. to St. Paul	19.94	19.94	.....	20.44
From Chicago, del. to Milwaukee	18.50	18.50	18.00	19.00
From Chicago, Toledo or Detroit, del. to Muskegon, Mich.	20.40	20.40	19.90	20.90
From Granite City, del. to St. Louis	18.00	18.50	17.50	.....
Basing Point:				
†Birmingham, Ala.	13.50	.....	12.50	.....
From Birmingham, del. to:				
Boston	18.62	.....	18.12	.....
Newark, N. J.	19.58	.....	.....	.....
Brooklyn, N. Y.	20.39	.....	.....	.....
Baltimore	19.02	.....	18.52	.....
Philadelphia	18.88	.....	18.38	.....
Cleveland	17.62	.....	17.50	.....
Cincinnati	18.13	.....	17.51	.....
Chicago	*17.72	.....	17.60	.....
St. Louis	17.62	.....	17.50	.....

†Southern delivery only. Prices at northern points are adjusted to quotations on northern iron. *Over 0.70 phos.

Basing Point:

Provo, Utah	16.50

LOW PHOS.

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.—$23.00. Basing point: Johnson City, Tenn.—$23.00

Philadelphia, standard and copper bearing	24.13

GRAY FORGE		CHARCOAL	
Valley furnace	17.25	Lake Superior fur.	20.50
Pitts. dist. fur.	17.75	Do., del. Chicago	23.54

SILVERY

Jackson county, O., base; 6%—$22.25; 7—$23.25; 8—$24.25; 9—$25.25; 10—$26.25; 11—$27.75.

BESSEMER FERROSILICON

Jackson County, O., base; 10%—$27.25; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25.

Iron Ore □ □

LAKE SUPERIOR ORE

Gross ton, 51½% Lower Lake Ports

Old range bess.	$4.30
Mesabi bessemer	4.65
Old range nonbess.	4.65
Mesabi nonbess.	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents, unit, del. E. Pa.

Foundry and basic, 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-65% (nom.)	10.00-10.50

FOREIGN ORE

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.00
No. Afr. & low phos.	9.50
Swedish basic, 65%	9.00
Swedish low phos.	9.50
Spanish No. Africa basic, 50 to 60%	9.00
Tungsten, spot, sh. ton unit, duty pd.	$14.00-14.25
N. F. fdy., 55%.	7.00
Chrome ore 48% gross ton, c.i.f.	$18.00

Manganese Ore □

(Nominal)

Prices, not including duty, cents per unit, cargo lots.

Caucasian, 52-55%	24.00
So. African, 52%.	24.00
So. Afr., 49-51%.	22.00
Indian, 58-50%	nominal
Indian, 48-50%	nominal

Refractories □ □

Per 1000 f.o.b. Works

FIRE CLAY BRICK

First Quality

Pa., Ohio, Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	48.00

Second Quality

Pa., Ohio, Ill., Ky., Md., Mo., Ga., Ala.	40.00
MALLEABLE BUNG BRICK all bases	50.00

SILICA BRICK

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00

MAGNESITE

Dead burned grain, Chester, Pa., Baltimore bases, net	40.00
Domes, Chewelah, Wash., base	22.00

BASIC BRICK

Net ton, f.o.b. Baltimore, Plymouth, Meeting, Pa., Chester, Pa.

Magnesite brick	$65.00
Chrome brick	45.00
Chemically bonded magnesite	55.00

Fluorspar 85-5 □ □

Washed gravel, duty paid, tide, gross ton	$21.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$14.75-15.00

Ferroalloys □ □

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
del. Pittsburgh	90.24
Spiegeleisen, 19-20%, dom., fur., spot†	26.00
Ferrosilicon, 50%, freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent.	126-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb	90.00
2% carbon	95.00
1% carbon	105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Ferrotungsten, stand., lb. cont.	1.16- 1.25
Ferrovanadium, 35 to 40%, lb. cont., on analysis	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
Do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17-19%, Rockdale, Tenn., basis, 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 50-60%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads. Quan. diff. apply.

Nonferrous Mill Products

F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 8.25c Conn. copper

Sheets	
Yellow brass (high)	13.75
Copper, hot rolled	15.00
Lead, cut, to jobbers	7.75
Zinc, 100-lb. base	9.00
Tubes and Pipes	
High yellow brass	16.25
Seamless copper	16.25
Rods	
High yellow brass	12.25
Copper, hot rolled	12.25
Anodes	
Copper, untrimmed	12.75
Wire	
Yellow brass (high)	14.25

Old Metals □ □

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
New York	4.50- 4.75
Chicago	4.37½-4.87½
Cleveland	5.00- 5.25
St. Louis	4.75- 5.00
Heavy Copper and Wire	
New York	6.12½- 6.25
Chicago, No. 1	5.75- 6.00
Cleveland	5.50- 5.75
St. Louis	5.75- 6.00
Composition Brass Borings	
New York	4.25- 4.50
Light Copper	
New York	5.25- 5.50
Chicago	4.50- 4.75
Cleveland	5.00- 5.25
St. Louis	4.75- 5.00
Light Brass	
Chicago	2.50- 2.75
Cleveland	3.00- 3.25
Lead	
New York	3.00- 3.25
*Cleveland	3.00- 3.25
Chicago	2.75- 3.00
St. Louis	3.10- 3.25
Zinc	
New York	2.25- 2.50
Cleveland	2.25
Chicago	2.25- 2.50
St. Louis	2.75- 3.00
Aluminum	
Clips, soft, Cleve.	13.50-14.50
Borings, Cleveland	7.00- 7.50
Mixed, cast, Cleve.	11.50-12.00
*Mixed, cast, St. L.	12.00-12.50

Secondary Metals □

Brass ingot, 85-5-5-5	8.00
Remelt al. No. 12	15.50-16.00

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL □

Birmingham	9.50-10.50
Boston, dealers	8.00- 8.25
Buffalo, No. 1	12.00-12.25
Buffalo, No. 2	10.50-11.00
Chicago	11.75-12.25
Cleveland, No. 1	12.00-12.50
Cleveland, No. 2	11.50-12.00
Detroit, No. 1	10.50-11.00
Detroit, No. 2	9.50-10.00
Eastern Pa.	11.50-12.00
Eastern Pa., No. 2	9.50-10.00
Federal, Ill.	9.00- 9.50
Granite City, Ill.	9.50-10.00
N. Y., deal. R. R.	9.00
N. Y., deal. No. 2	8.00
Pittsburgh, No. 1	14.25-14.75
Pitts., No. 1 (R. R.)	15.00-15.50
St. Louis, No. 1 del.	10.50-11.00
Valleys, No. 1	14.50-15.00

COMPRESSED SHEETS □

Buffalo, dealers	10.50-11.00
Chicago, factory	10.75-11.25
Cleveland	11.00-11.50
Detroit	10.75-11.25
E. Pa., new mat.	10.50
Pittsburgh	14.00-14.50
Valleys	14.00-14.50

BUNDLED SHEETS □ □

Buffalo	6.75- 7.25
Cincinnati, del.	7.00- 7.50
Cleveland	8.50- 9.00
Pittsburgh	13.00-13.50
St. Louis	5.75- 6.25

SHEET CLIPPINGS LOOSE □

Chicago	6.00- 6.50
Cincinnati	6.50- 7.00
Detroit	7.50- 8.00
St. Louis	5.00- 5.50

STEEL RAILS, SHORT □

Birmingham	12.00-12.50
Boston, dealers	7.75- 8.00
Buffalo	13.50-14.00
Chicago (3 ft.)	12.50-13.00
Chicago (2 ft.)	13.50-14.00
Cincinnati, del.	12.50-13.00
Detroit	11.50-12.00
Pitts., (open-hearth 3 ft. and less	16.00-16.50
St. Louis	12.50-13.00

STOVE PLATE

Birmingham	6.50- 7.50
Boston, dealers	4.75- 5.00
Buffalo	10.25-10.75
Chicago, net	7.75- 8.25
Cincinnati, dealers	7.00- 7.50
Detroit, net	7.50- 8.00
Eastern Pa.	8.50- 9.00
N. Y., deal. fdry.	6.00
St. Louis	6.50- 7.00

COUPLERS, SPRINGS □

Buffalo	13.00-14.00
Chicago, springs	13.00-13.50
Eastern Pa.	15.50
Pittsburgh	16.00-16.50
St. Louis	12.00-12.50

ANGLE BARS—STEEL □

Chicago	12.75-13.25
St. Louis	11.50-12.00

LOW PHOSPHORUS □ □

Buffalo, billets and bloom crops	13.00-14.00
Cleveland, billet, bloom crops	14.00-14.50
Eastern Pa. crops	14.00-14.50
Pittsburgh, billet, bloom crops	17.00-17.50
Pittsburgh, sheet bar crops	16.00-16.50

FROGS, SWITCHES □ □

Chicago	11.75-12.25
St. Louis	11.00-11.50

SHOVELING STEEL □ □

Chicago	11.75-12.00
St. Louis	9.00- 9.50

RAILROAD WROUGHT □

Birmingham	7.00- 8.00
Boston, dealers	6.00- 6.50
Buffalo, No. 1	9.25- 9.75
Buffalo, No. 2	12.00-12.50
Chicago, No. 1, net	9.25- 9.75
Chicago, No. 2	11.75-12.25
Cincinnati, No. 2	10.00-10.50
Eastern Pa.	12.50-13.00
N. Y., No. 1 deal	8.00- 8.50
St. Louis, No. 1	7.00- 7.50
St. Louis, No. 2	9.50-10.00

SPECIFICATION PIPE □

Boston	4.50- 4.75
Eastern Pa.	10.00
New York, dealers	5.25- 5.50

BUSHELING □ □

Buffalo, No. 1	10.50-11.00
Chicago, No. 1	10.75-11.00
Cinci., No. 1 deal	6.50- 7.00
Cincinnati, No. 2	3.00- 3.50
Cleveland, No. 2	9.00- 9.50
Detroit, No. 1 new	9.50-10.00
St. Louis, No. 1	6.50- 7.00
Valleys, new No. 1	14.00-14.50

MACHINE TURNINGS □

Bimingham	4.50- 5.00
Boston, dealers	4.75- 5.00
Buffalo	7.00- 7.50
Chicago	7.50- 8.00
Cincinnati, dealers	6.00- 6.50
Cleveland	9.00- 9.50
Detroit	7.50- 8.00
Eastern Pa.	7.50
New York, dealers	3.25- 3.50
Pittsburgh	11.00-11.50
St. Louis	5.25- 5.75
Valleys	12.00-12.50

BORINGS AND TURNINGS □

For Blast Furnace Use

Boston, dealers	3.25- 3.50
Buffalo	7.50- 8.00
Cincinnati, dealers	6.00- 6.50
Cleveland	9.00- 9.50
Detroit	8.00- 8.50
Eastern Pa.	6.50
New York, dealers	2.00- 2.50
Pittsburgh	9.00- 9.50

CAST IRON BORINGS □ □

Birmingham, plain	4.50- 5.00
Boston, chemical	8.50- 9.00
Boston, dealers	3.25- 3.50
Buffalo	7.50- 8.00
Chicago	7.50- 8.00
Cincinnati, dealers	6.00- 6.50
Cleveland	9.00- 9.50
Detroit	8.00- 8.50
E. Pa., chemical	12.00-15.00
New York, dealers	3.00- 3.50
Pittsburgh	9.00- 9.50
St. Louis	5.25- 5.75

PIPE AND FLUES □ □

Cincinnati, dealers	4.50- 5.00

RAILROAD GRATE BARS □

Buffalo	6.75- 7.25
Chicago, net	7.50- 8.00
Cincinnati	6.00- 6.50
Eastern Pa.	8.50- 9.00
New York, dealers	5.00- 5.50
St. Louis	5.50- 6.00

FORGE FLASHINGS □ □

Boston, dealers	6.00- 6.50
Buffalo	10.50-11.00
Cleve., over 10 in.	9.25- 9.75
Detroit	9.00- 9.50

FORGE SCRAP □ □

Boston, dealers	5.00- 6.00
Chicago, heavy	12.50-13.00
Eastern Pa.	10.50-11.00

ARCH BARS, TRANSOMS □

St. Louis	10.50-11.00

AXLE TURNINGS □ □

Boston, dealers	4.50- 5.00
Buffalo	9.00- 9.50
Chicago, elec. fur	10.50-11.00
Cleveland	9.50-10.00
Eastern Pa.	11.00
St. Louis	6.00- 6.50

STEEL CAR AXLES □ □

Birmingham	11.00-11.50
Boston, ship. point.	8.00- 8.50
Buffalo	12.25-12.75
Chicago, net	12.50-13.00
Eastern Pa.	14.00
St. Louis	11.50-12.00

SHAFTING □ □

Boston, ship. point.	11.00-11.25
Eastern Pa.	16.50
New York, dealers	11.50-12.00
St. Louis	9.00- 9.50

CAR WHEELS □ □

Birmingham, iron	9.00- 9.50
Boston, iron deal.	6.50- 6.75
Buffalo, iron	11.75-12.25
Buffalo, steel	13.00-13.50
Chicago, iron	12.25-12.75
Chicago, rolled steel	12.50-13.00
Cincinnati, iron	10.25-10.50
Eastern Pa., iron	13.50-14.00
Eastern Pa., steel	15.00-15.50
Pittsburgh, iron	13.00-13.50
Pittsburgh, steel	16.00-16.50
St. Louis, iron	9.50-10.00
St. Louis, steel	12.00-12.50

NO. 1 CAST SCRAP □ □

Birmingham	9.00- 9.50
Boston, No. 2	6.00- 6.25
Boston, tex. con.	10.50-11.00
Buffalo, cupola	11.75-12.25
Buffalo, mach.	13.00-13.50
Chicago, agri. net	8.50- 9.00
Chicago, mach. net	9.00-10.00
Chi., railroad net	9.00- 9.50
Cinci., mach. cup	10.75-11.25
Cleveland, cupola	11.50-12.50
Detroit, net	10.50-11.00
Eastern Pa., cupola	12.00-13.00
Pittsburgh, cupola	13.00-13.50
San Francisco, del.	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	9.00- 9.50
St. L., No. 1 mach.	9.00- 9.50

HEAVY CAST □ □

Boston, del.	6.75- 7.00
Buffalo, break.	8.75- 9.25
Cleveland, break.	8.50- 9.00
Detroit, break	9.00- 9.50
Detroit, auto net	11.50-12.00
Eastern Pa.	11.50-12.00
N. Y., No. 1, deal	8.00- 8.50
N. Y., break. deal	7.25- 7.75
Pittsburgh	12.00-12.50

MALLEABLE □ □

Boston, consum.	12.50-13.00
Buffalo	13.00-13.50
Chicago, R. R.	12.50-13.00
Cincinnati, agri. del.	9.00- 9.50
Cinci., R. R. del.	10.00-10.50
Cleveland, rail.	13.00-13.50
Detroit, auto	9.75-10.25
St. Louis, R. R.	10.00-10.50
Eastern Pa., R. R.	11.50-12.50

RAILS FOR ROLLING □

5 feet and over

Birmingham	11.00-11.50
Boston, dealers	7.75- 8.00
Buffalo	10.75-11.25
Chicago	12.50-13.00
Eastern Pa.	13.00
New York, dealer	7.50- 8.00
St. Louis	12.00-12.50

LOCOMOTIVE TIRES □

Chicago (cut)	12.50-13.00
St. Louis, No. 1	9.00- 9.50

LOW PHOS. PUNCHINGS □

Buffalo	13.00-14.00
Chicago	13.00-13.50
Eastern Pa.	14.50-15.00
Pittsburgh	16.00-16.50

Nonferrous Metal Prices of the Week

Spot unless otherwise specified. Cents per pound

	Copper: Electro., del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 98-99%	Antimony Spot. N. Y.	Ingot Nickel
March 3	8.00	8.12½	7.75	52.45	52.52½	4.00	3.90	4.40	*22.90	7.25	36.00
March 5	8.00	8.12½	7.75	52.50	52.52½	4.00	3.90	4.40	*22.90	7.35	36.00
March 6	8.00	8.12½	7.75	52.55	52.55	4.00	3.90	4.40	*22.90	7.50	36.00
March 7	8.00	8.12½	7.75	52.65	52.67½	4.00	3.90	4.40	*22.90	7.50	36.00
March 8	8.00	8.12½	7.75	53.12½	53.15	4.00	3.90	4.40	*22.90	7.62½	36.00
March 9	8.00	8.12½	7.75	53.65	53.67½	4.00	3.90	4.37½	*22.90	7.62½	36.00

*Nominal quotation. Market range 19.00c to 22.90c.

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	□
Baltimore*	2.75c
Boston††	2.90c
Buffalo	2.95c
Chattanooga	3.26c
Chicago	2.90c
Cincinnati	3.10c
Cleveland	2.90c
Detroit	2.98½c
Houston	3.00c
Los Angeles	3.40c
New Orleans	3.00c
New York‡(d)	3.17c
Pittsburgh	2.85c
Philadelphia*	2.75c
San Francisco	3.55c
Seattle	3.40c
St. Louis	3.14c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS	□
Portland	3.40c
Baltimore*	2.60c
Chattanooga	3.26c
Chicago	2.75c
Cincinnati	3.10c
Detroit	2.98½c
New York‡(d)	3.10c
Philadelphia*	2.75c
St. Louis	3.14c
Tulsa	3.25c

REINFORC. BARS	□
Boston	2.75c-3.25c
Buffalo	1.95c
Chattanooga	3.26c
Chicago	1.95c-2.10c
Cleveland (c)	1.97½c
Cincinnati	3.10c
Houston	3.25c
Los Ang., cl.	2.15c
New Orleans	3.00c
New York	3.17c
Philadelphia	2.62½c
Pitts., plain	3.00c
Pitts., twisted squares	3.12½c
San Francisco	2.45c
Seattle	2.45c
St. Louis	3.29c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES	□
Baltimore*	2.75c
Boston††	3.07c
Buffalo	3.20c
Chattanooga	3.46c
Chicago	3.10c
Cincinnati	3.30c
Cleveland	3.21c
Detroit	3.30c
Houston	3.00c
Los Angeles	3.40c
New Orleans	3.50c
New York(d)	3.27c
Philadelphia*	2.75c
Pittsburgh	3.05c
Portland	3.40c
San Francisco	3.50c
Seattle	3.40c
St. Louis	3.34c
St. Paul	3.25c
Tulsa	3.50c

PLATES	□
Baltimore*	2.75c
Boston††	3.08c
Buffalo	3.20c
Chattanooga	3.46c
Chicago	3.10c
Cincinnati	3.30c
Cleveland, ¼-in. and thicker	3.21c
Cleve., ⅜-in.	3.20c
Detroit	3.30c
Detroit, ⅜-in.	3.10c
Houston	3.00c
Los Angeles	3.40c
New Orleans	3.50c
New York(d)	3.30c
Philadelphia*	2.75c
Phila. floor	4.35c
Pittsburgh	3.05c
Portland	3.40c
San Francisco	3.50c
Seattle	3.40c
St. Louis	3.34c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE	□
Baltimore*	2.95c
Boston††	3.15c
Buffalo	3.10c
Chattanooga	3.26c
Chicago	2.95c
Cincinnati	3.10c
Cleveland	3.01c
Det., 8-10 ga.	3.03½c
Houston	3.35c
Los Angeles	3.65c
New Orleans	3.50c
New York	3.17c
Portland	3.65c
Philadelphia*	2.95c
Pittsburgh	2.85c
San Francisco	3.75c
Seattle	3.65c
St. Louis	3.19c-3.36c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK	□
Baltimore*†	3.50c
Boston (g)	3.75c
Buffalo	3.25c
Chattanooga	4.01c
Chicago	3.70c
Cincinnati	3.85c
Cleveland	3.76c
Detroit	3.78½c
Los Angeles	4.15c
New York	3.65c
Philadelphia*†	3.40c
Pittsburgh**	3.40c
Portland	4.25c
San Francisco	4.25c
Seattle	4.25c
St. Louis	3.94c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS	□
Baltimore*†	3.75c
Buffalo	4.00c
Boston (g)	4.35c
Chattanooga	4.61c
Chicago	4.20c-4.30c
Cincinnati	4.45c
Cleveland	4.36c
Detroit	4.45c
Houston	4.40c
Los Angeles	4.75c
New Orleans	4.35c
New York	4.25c
Pitts.**	3.90c-4.20c
Portland	4.85c
San Francisco	4.85c
Seattle	4.85c
St. Louis	4.54c
St. Paul	4.19c
Tulsa	5.10c
Philadelphia*†	4.00c

BANDS	□
Baltimore	3.05c
Boston††	3.15c
Buffalo	3.30c
Chattanooga	3.51c
Chicago	3.20c
Cincinnati	3.35c
Cleveland	3.26c
Detroit, ⅜-in. and lighter	3.28½c
Houston	3.25c
Los Angeles	3.90c
New Orleans	3.20c
New York(d)	3.42c
Philadelphia	3.05c
Pittsburgh	3.10c
Portland	3.90c
San Francisco	4.05c
Seattle	3.90c
St. Paul	3.20c
Tulsa	3.45c
St. Louis	3.44c

HOOPS	□
Baltimore	2.80c
Boston	4.15c
Buffalo	3.55c
Chicago	3.20c
Cincinnati	3.35c
Det., No. 14 and lighter	3.28½c
New York	3.42c
Philadelphia	3.30c
Pittsburgh	3.60c
Seattle	5.40c
St. Paul	3.75c

COLD FIN. STEEL	□
Baltimore (c)	3.71c
Boston	4.00c-4.50c
Buffalo (h)	3.55c
Chattanooga*	4.06c
Chicago (h)	3.50c
Cincinnati	3.70c
Cleveland (h)	3.50c
Detroit	3.63½c
Los Ang.(f)(d)	5.95c
New Orleans	4.25c
New York	3.92c-4.42c
Philadelphia	3.73c
Pittsburgh(h)	3.45c
Portland (f)	4.75c
San Fran.(f)(d)	5.95c
Seattle (f)(d)	4.75c
St. Paul	3.20c
St. Louis	3.74c
Tulsa	4.65c

COLD ROLL. STRIP	□
Boston, 0.100-in., 500 lb. lots	5.20c
Buffalo	5.25c
Chicago (b)	5.65c
Cincinnati	5.80c
Cleveland (b)	5.55c
Detroit	5.40c
Philadelphia	4.00c
New York	4.55c
St. Louis	5.74c

(b) Net base, straightening, cutting, boxing, 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
(f) Rounds only.
(g) 50 bundles or over.
(h) Outside delivery, 10c less.

‡Domestic bars.
*Plus quan. extras.
**Under 25 bundles.
*†50 or more bundles.
†New extras apply.
††Base 40,000 lbs. extras on less.

Prices at Detroit, Cleveland, Chicago, Pittsburgh, Cincinnati, Chattanooga, New York, Boston, St. Louis on heavier lines are subject to new quantity differentials:

399 pounds and less, up 50 cents; 400 to 9999 pounds, base; 10,000 to 19,999 pounds, 15 cents under; 20,000 to 39,999 pounds, 25 cents under; 40,000 pounds and over, 35 cents under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Mar. 8

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

PIG IRON	British gross tons U. K. ports £ s d		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665 £ s d	
Foundry, 2.50-3.00 Silicon	$14.89	2 18 6	$8.27	1 14 0
Basic bessemer	13.74	2 14 0*	7.30	1 10 0
Hematite, Phos. .03-.05	16.67	3 5 6	....	.....
SEMIFINISHED STEEL				
Billets	$28.00	5 10 0	$11.44	2 7 0
Wire rods, No. 5 gage	39.70	7 16 0	21.90	4 10 0
FINISHED STEEL				
Standard rails	$39.45	7 15 0	$26.77	5 10 0
Merchant bars	1.65c	7 5 0	.72c	3 5 0
Structural shapes	1.67c	7 7 6	.63c	2 17 6
Plates, †¼ in. or 5 mm.	1.82c	8 0 0	.91c	4 2 6
Sheets, black, 24 gage or 0.5 mm.	2.10c	9 5 0	1.27c	5 15 0
Sheets, gal., 24 gage, corr.	2.55c	11 5 0	1.43c	6 10 0
Bands and strips	1.82c	8 0 0	.88c	4 0 0
Plain wire, base	2.21c	9 15 0	1.18c	5 7 6
Galvanized wire, base	2.61c	11 10 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	2.72c	12 0 0	1.27c	5 15 0
Tin plate, box 108 lbs.	$ 4.19	0 16 6	....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d 4($3.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks	
Fdy. pig iron, Si. 2.5	$17.18	3 7 6(a)	$13.16	200	$14.21	305	$25.00	63
Basic bessemer pig iron	16.54	3 5 0(a)	12.11	185	13.51	290	27.58 (b)	69.50
Furnace coke	4.07	0 18 0	7.90	120	5.13	110	7.64	19.25
Billets	28.00	5 10 0	28.29	430	20.50	440	38.29	96.50
Standard rails	1.87c	8 5 0	2.10c	700	2.31c	1,100	2.38c	132
Merchant bars	1.95c	8 12 0	1.68c	560	1.16c	550	1.98c	110
Structural shapes	1.99c	8 15 0	1.65c	550	1.16c	550	1.94c	107.50
Plates, †¼-in. or 5 mm.	1.96c	8 12 6	2.10c	700	1.47c	700	2.29c	127
Sheets, black	2.33c	10 5 0‡	2.55c	850‡	1.63c	775‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.89c	12 15 0	4.35c	1,450	3.15c	1,500	6.66c	370
Plain wire	2.21c	9 15 0	3.39c	1,130	2.31c	1,100	3.11c	173
Bands and strips	2.38c	10 10 0	1.95c	650	1.47c	700	2.29c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. (a) del. Middlesbrough. (b) hematite

Bars

Bar Prices, Page 48

Pittsburgh—Several leading farm implement manufacturers are active in the bar market, supplementing a steady flow of specifications from the automotive field. Carbon and alloy bars have been reaffirmed at present prices for second quarter, and although producers' books are open, little interest is shown.

Cleveland — New orders and releases so far this month are practically double the volume in the comparable period in February. Consumers appear more anxious to cover second quarter requirements, and some contracts for substantial amounts were closed during the week. Fear of labor difficulties has caused some anxiety among automobile manufacturers. Except for some good specifications resulting from Pennsylvania equipment orders, railroad demand has not picked up to any considerable extent. Hardware manufacturers and road machinery builders are more active.

Chicago—Bars continue most active of heavy products with additional improvement in specifications from farm implement manufacturers and miscellaneous consumers. Automotive interests continue the largest single group of buyers, with shipments improving steadily. Interest in second quarter purchases is light and consumers are slow to make commitments now that books are open at unchanged prices. Rail steel and iron bars continue in fairly active demand from a variety of consumers.

Boston—A slight improvement in commercial steel bar specifications is noted, buying by small tool builders and jobbers for next quarter adding to the volume. Prices are firm and unchanged at 2.15c, delivered, Boston.

Philadelphia — Contracting for steel bars for second quarter is getting under way slowly with current specifications better than a month ago but far from brisk. Bars are 2.04c, Philadelphia. Specifications for common iron bars are light.

Plates

Plate Prices, Page 48

Pittsburgh — Federal building still dominates the plate market. River barge and equipment interests have little to figure otherwise and among work closed on recently of this class was 1500 tons for two dredges for United States engineers at Kansas City, Mo., which Marietta Mfg. Co., Pt. Pleasant, W. Va., will build and about 500 tons for pontoons and pipe which McClintic-Marshall Corp., Bethlehem, Pa., will build for the same office. Dravo Contracting Co., Pittsburgh, last week closed on two fair size boat repair jobs for the Cincinnati engineers, requiring unstated tonnages of plates and other materials. American Bridge Co., Pittsburgh, is preparing to repair 20 Carnegie Steel Co. barges, requiring about 700 tons of plates. Aside from a recent order for plain material, including plates, distributed by the Pennsylvania to the benefit of district mills, there has been little additional railroad buying. The market on plates at 1.70c, Pittsburgh, has been reaffirmed for second quarter.

Cleveland — Demand is restricted to small, miscellaneous lots, railroad car construction requirements not having developed volume as yet. Recent inquiries include plates of special analysis for oil refining equipment, rapid developments in this field indicating larger markets as modernization plans proceed. The Cleveland plate mill operated during the week at about 40 per cent.

Chicago — While some increase is reported in miscellaneous tank business, such work is confined principally to small lots. Oil companies are slow to inquire for equipment for proposed improvement programs, while the pipe line market is devoid of large inquiries. Railroad plate needs, currently light, will increase shortly with placing of orders for equipment building and repairs.

Boston—Demand for plates holds steady with an increase in demand for brewery and distillery work. The Croft brewery, Boston, is taking several hundred tons for new tank work. An Eastern Pennsylvania mill is shipping against plate requirements for a destroyer being built at Bath, Me. Railroads are taking plates in slightly better volume and prices are unchanged at 1.80c, Coatesville, Pa.

New York—Plate sellers are encouraged by increased specifications for railroad equipment. Figures are being prepared on requirements for seven coast guard cutters to be built in navy yards, involving 4200 tons of plates, shapes, bars and strip. Bids will be opened March 20.

Philadelphia — Miscellaneous tonnage is slightly better but eastern plate mill operations are adversely affected by completion of hull tonnage for cruisers awarded last summer and released early this year. Specifications for seven coast guard cutters to be built in eastern navy yards may come out soon. Additional railroad releases are noted. Plates are 1.80c, Coatesville, Pa., 1.81½c, Philadelphia.

Washington—Bureau of supplies and accounts, navy department, opened bids March 2 on high tensile steel plates and shapes to a new specification, suitable for welding. This is a follow-up on the opening originally scheduled for Dec. 8 and later postponed to Dec. 22. The quantities are 825 tons of plates and 400 tons of shapes, against the original inquiry of 1625 tons of plates and 700 tons of shapes, and the analysis of the steel also was slightly changed.

Contracts Placed

1500 tons, two super-stern wheel 34-inch suction dredges for United States engineers, Kansas City, Mo., to Marietta Mfg. Co., Pt. Pleasant, W. Va.

700 tons, repairs to 20 Carnegie Steel Co. barges, to American Bridge Co., Pittsburgh.

500 tons, 20 pontoons and 1000 feet of 28-inch flanged pipe for United States engineers, Kansas City, Mo., to McClintic-Marshall Corp., Bethlehem, Pa.

250 tons, pipe line, Albrook Field, C. Z.; to unnamed interest.

200 tons, tanks, Richmond, Ind., to Western Gas Construction Co., Ft. Wayne, Ind.

150 tons, tanks, Mitchell, S. D., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

100 tons, tank, Kaukauna, Wis., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

Sheets

Sheet Prices, Page 48

Pittsburgh — Little interest is shown by sheet buyers in the second quarter. Present prices hold at 2.25c, Pittsburgh, on black sheets, 2.85c on galvanized and 1.75c on No. 10 gage hot-rolled. Demand still is coming mainly from automobile makers, but electrical sheets and other specialties also are active.

Boston—Sheet buying has improved slightly. Small tank fabricators are taking fair tonnages, while railroads are more active, notably the New York, New Haven & Hartford which is ordering out more sheets for repairs.

Cleveland — Some orders have been placed by automobile manufacturers for April, to insure early delivery after completion of first quarter contracts. Few contracts, however, have been booked covering their requirements for the entire second quarter. Pressure for material has not relaxed, and mill operations continue at their recent high rate. Good specifications also are

being received from refrigerator manufacturers.

Philadelphia—Sheet specifications so far this month are at a better rate than in February. Sellers are pondering the question whether recently purposed NRA policies for raising wages will stimulate buying or check it temporarily.

New York—Construction work is stimulating sheet inquiry, which otherwise shows little change. Makers of stainless steels lost 13 tons for kitchen equipment in the Rockefeller Center to monel metal equipment manufacturers.

Cincinnati—Lighter specifications for sheets from the automobile makers, partly due to labor troubles, are offset by increased demand from other users. Production remains near 70 per cent.

St. Louis — A favorable development in sheets is the wide diversity of requirements.

Birmingham, Ala.—Sheet mills in the district continue on fair production schedule. Demand from agricultural sections has not developed as well as anticipated.

Railroads

Track Material Prices, Page 49

Tennessee Coal, Iron & Railroad Co. is reported to have booked 13,200 tons of 100-pound rails and 2000 tons of accessories for the Seaboard Air Line, and 18,000 tons of rails for the St. Louis & San Francisco. The Erie has placed 1250 tons of rails with Bethlehem Steel Co. for improvements at Elmira, N. Y.

New York Central will open bids under the Clayton act March 20 on 40,000 tons of rails and 30,000 kegs of spikes, about 1,700,000 tie plates, 3550 kegs of track bolts for new rails and 3575 to 4700 kegs for maintenance. Bangor & Aroostook has distributed 750 tons of tie plates among several producers.

Rail inquiries likely to be closed soon include 10,000 tons for the Wabash, 20,000 tons for the Chicago, Milwaukee, St. Paul & Pacific, 21,600 tons for rails and 6733 tons of fastenings for Illinois Central.

Edgar Thomson rail mill of Carnegie Steel Co. has completed rolling of a number of small lots and this week expects to start on its order from the Pennsylvania for 42,000 tons.

Placing of other railroad material is more active. The Erie has awarded 8000 chilled iron car wheels to the American Car & Foundry Co., to be produced at its plant at Berwick, Pa. Specialties for the 12,725 freight cars ordered by the Van Sweringen lines are being placed.

The Pennsylvania has given the Pressed Steel Car Co., Pittsburgh, an order for frames, brake beams, castings and other materials, totaling about $300,000. It has awarded to the National Malleable & Steel Castings Co., Cleveland, a contract for trucks for 250 fifty-ton cars. Pressed Steel Car Co., Pittsburgh, has been awarded rebuilding of 100 seventy-ton hoppers for Donner, Hanna Coke Corp., Buffalo.

Seaboard Air Line has filed an application with the interstate commerce commission for permission to borrow $3,000,000 to $3,500,000 from PWA for locomotives and cars.

PWA loans approved include $910,000 to the Boston & Maine for repair of 25 locomotives, 174 box cars, 644 coal cars and 80 passenger cars, installation of air-conditioning equipment in 10 passenger cars and new seats in 10 passenger cars.

Chicago, Milwaukee, St. Paul & Pacific is loaned $2,317,000 to buy 20,000 tons of rails, 25,658 tons of fastenings, air-conditioning equipment in 22 cars and place 300 automobile loading devices in freight cars. New York Central is loaned $400,000 with which to lay 37,000 tons of rails. Lehigh Valley is loaned $600,000 for purchase of five locomotives, the previous loan of $500,000 being found too small.

Final returns indicate the placing of 19,725 freight cars by domestic lines in February, the largest monthly total in several years. These were composed of three major lots: 12,725 for the Van Sweringen lines; 6500 on which the Pennsylvania got final approval for construction in its own shops; and 500 for the Lehigh & New England. As only 152 were placed in January, the total for the first two months was 19,877, against three in the corresponding period of last year, 194 in the first two months of 1932 and 150 in the same period of 1931. Further comparisons are:

	1934	1933	1932	1931
Jan.	152	3	159	100
Feb.	19,725	0	35	50
2 mo.	19,877	3	194	150
March	.....	5	105	2,166
April	.....	50	0	2,798
May	.....	8	60	20
June	.....	500	0	1,910
July	.....	306	25	617
Aug.	.....	202	5	1,304
Sept.	.....	23	1,298	702
Oct.	.....	514	0	980
Nov.	.....	533	2	35
Dec.	.....	316	50	11
Total	.....	2,460	1,739	10,694

Car Orders Placed

Alaska Railroad, 10 air dump cars, 25-yard capacity, to Western Wheeled Scraper Co., Aurora, Ill.

Alaska, 20 hoppers, to Koppel Industrial Car & Equipment Co., Koppel, Pa.

Locomotives Placed

Lehigh Valley, five locomotives, to Baldwin Locomotive Works, Eddystone, Pa.

Rail Orders Placed

Erie, 1250 tons for Elmira, N. Y., improvement, to Bethlehem Steel Co., Bethlehem, Pa.

Seaboard Air Line 13,200 tons, 100-pound rail, 2000 tons accessories, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

St. Louis & San Francisco, 18,000 tons rails, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Car Orders Pending

Boston & Maine, 21 suburban coaches; inquiry for 20 de luxe coaches reduced to 10.

Navy, Washington, five 50-ton freight cars, Mare Island navy yard; bids March 16.

Locomotives Pending

South African Railways & Harbours, Johannesburg, South Africa, 50 locomotives, 4-8-2 type, bids asked; specifications call for aluminum foil insulation of boilers.

Rail Orders Pending

Wabash, 10,000 tons; receivers announce inquiry.

Pipe

Pipe Prices, Page 49

Pittsburgh—Except in boiler tubes and some sizes of standard pipe where improvement continues, the market for tubular products still is slow. As detailed on page 49 of STEEL this week, revised footnotes under lap weld, charcoal iron, and both cold-drawn and hot-rolled seamless boiler tubes incorporate the changes for new quantity discounts as of Feb. 21.

Cleveland—Light demand is noted in this district. Jobbers' requirements which have constituted the principal outlet for steel pipe recently, have tapered, due in part to weather conditions.

Boston—Demand for cast pipe has dropped, although Plymouth, Mass., bought 300 tons from the Florence, N. J., foundry. It is estimated CWA work in southern New England has taken several thousand tons with the bulk of requirements placed. Northern New England, however, still has considerable CWA material yet to be bought.

Chicago—Cast pipe orders for small lots are in fair number, but

bookings of larger tonnages remain slow. Releases on a number of orders booked several months ago still are awaited. Pending tonnages are large and most of the water system and sewage disposal projects planned by small municipalities in this area are expected to be carried out although start of work on many will be delayed.

New York—Aqua Systems Inc., New York, is buying fair tonnages of galvanized wrought iron and steel pipe for gasoline fueling systems at flying fields. Pipe for these systems ranges from 1¼ to 6 inches in diameter.

Philadelphia—Award of 3500 tons of 28-inch welded steel pipe for the Fort Peck dam in Montana has been made to the McClintic-Marshall Corp., Bethlehem, Pa.

Cast Pipe Placed

300 tons, 8-inch, Plymouth, Mass., to R. D. Wood & Co., Philadelphia.

100 tons, 4 and 8-inch, class 150, Daly City, Calif., to United States Pipe & Foundry Co., Burlington, N. J.

Steel Pipe Placed

3500 tons, 28-inch welded, Fort Peck dam site, Montana, to McClintic-Marshall Corp., Bethlehem, Pa.

800 tons, caisson pipe, foundations for parcel post building, Boston, to Walsh-Holyoke Steam Boiler Works, Holyoke, Mass.; through C. J. Maney, general contractor.

Cast Pipe Pending

875 tons, 16-inch and under, Gretna, La.; bids March 27.

360 tons, 4 to 8-inch, class 150, Morgan Hill, Calif.; bids opened.

120 tons, 8 and 12-inch, class 150, Beverly Hills, Calif.; bids March 27.

119 tons, 4-inch, class 150, East Bay municipal utility district, Oakland, Calif.; bids March 14.

100 tons, 6 to 12-inch, with fittings, Houston, Tex.; bids in.

Unstated tonnage, 1970 feet, 8-inch, class B or 150; 834 feet, 6-inch; also hydrants, valves and fittings; Pascagolua, Miss.; L. C. Winterton, engineer; bids March 27.

Steel Pipe Pending

280 tons, ¼ to 4-inch, Long Beach, Calif.; bids in.

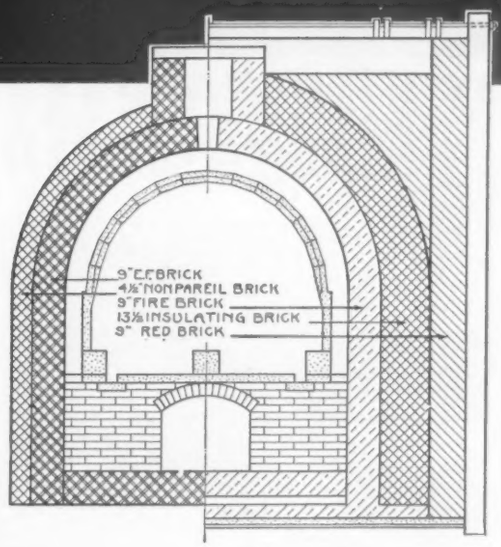
Unstated tonnage, 4 miles, ½ to 4-inch welded, Montgomery locks, Pittsburgh; bids to United States engineer, March 17.

Ferroalloys

Ferroalloy Prices, Page 50

Pending formal opening of books for ferroalloys, around March 15, prices on ferromanganese for second quarter are not yet defined, though no change is expected. Specifications are well sustained.

SEE HOW EF BRICK *save furnace space*



EXAMINE closely the furnace diagram above! It shows plainly the utility of Armstrong's new EF Insulating Brick in cutting down outside furnace area without cutting down furnace production!

For EF Brick require no fire brick protection, except when subject to the direct impingement of the flame or abrasive action. In the muffle-type enameling furnace shown, wall thickness is reduced from 31½" in the old style construction to only 13½" for EF Brick and Nonpareil Brick combined.

And vitally important, too, is the fact that the *weight* of the EF Brick wall is only one-fifth that of the heavier construction. This light weight makes EF Brick ideal for arch work. And because it has a lower heat capacity and hence permits your furnace to come to temperature more quickly, use of EF Brick means a more rapid turnover with less investment in furnace capacity, as well as definite fuel savings.

We'll gladly send a sample and a copy of our new bulletin containing complete information about Armstrong's EF Brick. Also, the facts about our two other high temperature insulating brick—Armstrong's and Nonpareil Insulating Brick. Just write Armstrong Cork & Insulation Co., 985 Concord Street, Lancaster, Pa.

Armstrong's . EF . Nonpareil

THREE INSULATING BRICK FOR INDUSTRIAL FURNACES

Shapes

Structural Shape Prices, Page 48

Pittsburgh—Alteration or replacement of 17 bridges, with the additional possibility that three new bridges will be required, is part of the recommendation last week by the chief of army engineers to the secretary of war in connection with an expenditure of $37,000,000 for improvements to the Beaver and Mahoning rivers. Currently the structural steel market is slow, with increased competition noted from several fabricating interests. Booth & Flinn Co., Pittsburgh, is placing about 1700 tons of piling for the Montgomery island dam. Plain structural shapes have been reaffirmed at 1.70c, Pittsburgh, for the second quarter; and steel piling at 2.00c, base, Pittsburgh.

Cleveland—Awards improved during the week, including 200 tons for a Toledo, O., armory, 195 tons for a Pennsylvania railroad dock in Cleveland, and 185 tons for a Ross county, Ohio, bridge. A new state letting for March 16 includes 150 tons for a bridge at Paulding, O. Some fabricators report small jobs more plentiful.

Chicago—Several private building projects are pending, including a store addition and two industrial plant jobs, requiring a total of 1300 tons. In other districts public work predominates with highway bridges the leading items. Kansas City Bridge Co. is low on the 4075-ton bridge at South Omaha, Nebr.

Boston—Close to 15,000 tons, namly bridges, are pending in New England, bids being in on 5000 tons for the Fore river bridge, Quincy-Weymouth, Mass., a Bethlehem, Pa., fabricator being low. The smaller structural shops in New England are doing little work.

Philadelphia—While private construction continues negligible, a slight improvement is noted in public work, including 3000 tons for an airplane depot at Middletown, Pa., on which bids open March 21. Plain shape prices are unchanged.

BUILT BY MORGAN *Engineering* » »

TWO Morgan 7½-ton, 6-motor, 63′ 6″ span four-girder Low Type Soaking Pit cranes, with worm operated trolleys, are shown here. They were installed to replace two Morgan Tower Type Pit cranes which had been in service for 30 years—a conspicuous, but not unusual record of Morgan engineering integrity. For charging ingots into soaking pits and withdrawing them, this type of crane performs the work with the minimum of expense and labor. Morgan engineers developed the one-piece box section cast steel trolley frame that severe service cannot distort. We have built a large number of Soaking Pit Cranes equipped with roller bearings and worm reduction units; the names of their users—the names of the leaders in the steel industry.

Morgan Products Include

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PLATE MILLS
CONTINUOUS MILLS
STRUCTURAL MILLS
ELECTRIC TRAVELING CRANES
CHARGING MACHINES
INGOT STRIPPING MACHINES
LADLE CRANES
SOAKING PIT CRANES
STEAM HAMMERS
STEAM HYDRAULIC FORGING PRESSES
SPECIAL MACHINERY FOR STEEL MILLS

DESIGNERS
MANUFACTURERS
CONTRACTORS

THE MORGAN ENGINEERING COMPANY

New York, 11 W. 42d St. ALLIANCE, OHIO *Pittsburgh, 1420 Oliver Bldg.*

Contracts Placed

3500 tons, radio towers for navy in Summit, Canal Zone, and Lualualei, T. H., to United States Steel Products Co., New York.

1800 tons, buildings for Titanium plant, South Amboy, N. J., to American Bridge Co., Pittsburgh; through Wigdon-Abbott Co.

780 tons, state highway bridge, Bremo, Va., to Virginia Bridge & Iron Co., Roanoke, Va.

720 tons, state highway bridge, Logan, W. Va., to American Bridge Co., Pittsburgh.

550 tons, state highway bridge, York, Pa., to Phoenix Bridge Co., Phoenixville, Pa.

410 tons, Temple, Tex., 1,000,000-gallon elevated tank, to Chicago Bridge & Iron Works, Chicago.

370 tons, warehouse, Fort Sam Houston,

Shape Awards Compared

	Tons
Week ended March 10	13,725
*Week ended March 3	22,671
Week ended Feb. 24	13,391
This week in 1933	16,055
Weekly average for 1933	15,413
Weekly average 1934	16,822
Weekly average February	19,676
Total to date 1933	107,717
Total to date 1934	185,044

*Revised

Tex., to Houston Structural Steel Co., Houston.

325 tons, two mooring barges for bank grader, United States engineers, Vicksburg, Miss., to Jones & Laughlin Steel Corp., Pittsburgh.

255 tons, state highway bridge, Queens New York, to National Bridge Works, Long Island City, N. Y.; through P. T. Cox Construction Co.

250 tons, bridge, Seminole county, Okla., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

225 tons, bridge, Decatur, Ill., to McClintic-Marshall Corp., Bethlehem, Pa.

217 tons, shapes and bars, Craig county, Okla., to Klein Iron & Foundry Co., Oklahoma City; through Nims & Frost, general contractors.

215 tons, widening viaduct, Mountain View, N. J., to James Radcliffe & Sons Co., Paterson, N. J.; through J. F. Chapman & Sons, general contractors.

200 tons, building for American Zirconium Corp., Baltimore, to Dietrich Bros., Baltimore.

200 tons, naval armory, Toledo, O., to Whitehead & Kales Co., Detroit.

195 tons, including 180 tons of sheet piling and 15 tons of anchor rods, Pennsylvania railroad dock No. 24 at Cleveland, to Kalman Steel Corp. Bethlehem, Pa.; through Drury Construction Co., Cleveland.

185 tons, state bridge, Ross county, Ohio, to Burger Iron Co., Akron, O.

180 tons, Reading railroad bridge, Gordon, Pa., to McClintic-Marshall Corp., Bethlehem, Pa.

175 tons, pier towers for Cape Cod, Mass., bridges, to Phoenix Bridge Co., Phoenixville, Pa.; through P. J. Carlin Construction Co., New York.

160 tons, state highway bridge, Waynesboro, Va., to Roanoke Iron & Bridge Co., Roanoke, Va.

160 tons, addition to squadron officers' school, Montgomery, Ala., to Ingalls Iron Works Co., Birmingham, Ala.; also 29 tons of concrete bars.

155 tons, ordnance shop, Fort Sam Houston, Tex., to Alamo Iron Works, San Antonio, Tex.

150 tons, substructure, Saugus river, bridge, Revere-Lynn, Mass., to Kalman Steel Corp., Bethlehem, Pa.; through Crandall Engineering Co.

130 tons, remodeling and installing six boilers, central heating plant, Washington navy yard, to Dietrich Bros., Baltimore. Capitol City Iron Works, Richmond, Va., awarded 55 tons of plates. E. D. Fouke, Washington, general contractor.

125 tons, building for Hall China Co., East Liverpool, O., to Pittsburgh Bridge & Iron Works, Pittsburgh.

125 tons, bridge, Jalama, Calif., to American Bridge Co., Pittsburgh.

115 tons, shapes and bars, bridges, Creek county, Oklahoma, to Paterson Steel Co., Tulsa, Okla.; through E. F. Fike & Co., Tulsa.

114 tons, plate girder bridge, Curwensville borough, Clearfield county, Pennsylvania, to Lackawanna Steel Construction Corp., Buffalo; through Minns Bros., DuBois, Pa.; Electric Welding Co., Pittsburgh, awarded 25 tons of plain steel bars; Bids of Feb. 9.

100 tons, approximately, plate girder bridge, Troy township, Bradford county, Pennsylvania, to Jones & Laughlin Steel Corp., Pittsburgh; through C. F. Goeringer Construction Co., Wilkesbarre, Pa.; bids of Feb. 9.

100 tons, building, St. Louis, to Banner Iron Works, St. Louis.

100 tons, 91 trusses for United States forest service, San Francisco, to Golden Gate Iron Works, San Francisco.

Contracts Pending

5000 tons, superstructure Fore river bridge, Quincy, Mass.; McClintic-Marshall Corp., Bethlehem, Pa., low.

4075 tons, bridge, South Omaha, Nebr.; Kansas City Bridge Co., Kansas City, Mo., low.

3500 tons, shops for United States air corps, Middletown, Pa.

3167 tons, estimated municipal construction for 1934, Miami, Fla.

3000 tons, airplane depot, Middletown, Pa.; bids March 21.

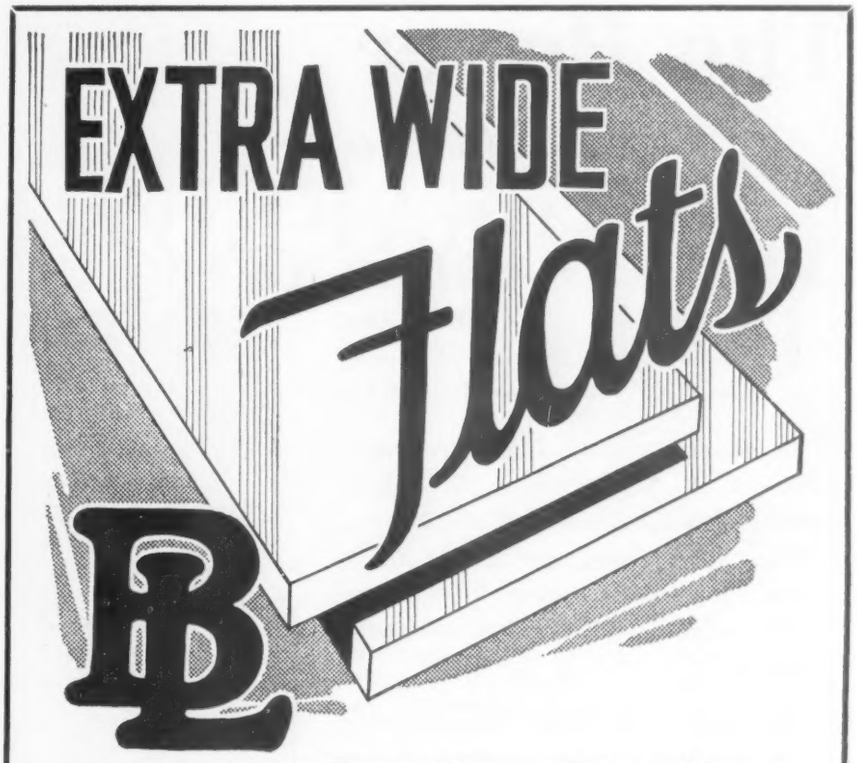
2600 tons, Apalachicola, Fla.; bids March 22.

2000 tons, state hospital Norristown, Pa.; decision regarding financing expected shortly.

1800 tons, addition to store building for W. H. Block Co., Indianapolis.

1500 tons, Richmond street powerhouse for Philadelphia Electric Co., Philadelphia; bids postponed pending revised specifications.

1200 tons, highway bridges, Nebraska.



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The standard widths are 8", 10" and 12" with thickness ¼" to 2". Intermediate widths can be furnished when desired. All of these extra wide flats are cold sawed to length and on no occasion sheared. They are manufactured to a size tolerance of plus nothing minus .008" in all cases.

Surveys conducted in many Industrial Plants have definitely shown that there is a real saving thru the use of Cold Drawn Extra Wide Flats. On your next order of steel involving any of the above applications, may we invite your attention to the B&L Product.

Bliss & Laughlin, Inc.

Harvey, Ill. **Buffalo, N. Y.**

Sales Offices in all principal cities

1000 tons, John Marshall high school, Rochester, N. Y.; bids March 14.
700 tons, parcel post building, Richmond, Va.
680 tons, bascule span, Campostela bridge, Norfolk, Va.
660 tons, Wilson high school, Washington; bids March 9; previously noted as involving 400 tons.
650 tons, Binghamton, N. Y., postoffice, refigured; Spence Bros., Saginaw, Mich., low bidders.
600 tons, store extension, Davis Co., Chicago.
600 tons, seven highway bridges, Texas.
500 tons, addition to high school, Beloit, Wis.
500 tons, state sanitorium, Trenton, N. J.; bids March 13.
480 tons, Pennsylvania railroad bridge, Camden, N. J.; bids opened.
475 tons, government buildings, Aberdeen, Mo.; J. L. Robinson, Baltimore, awarded construction contract requiring 310 tons, and Kobin Constructions, Philadelphia, remainder.
450 tons, bridge over Rancocas creek, Burlington county, New Jersey.
400 tons, materials handling equipment for Wisconsin Steel Works, South Chicago, Ill.
400 tons, municipal stadium, Syracuse, N. Y.; bids soon.
365 tons, highway bridges, Mississippi.
356 tons, piling, widening of American river bridge, Sacramento, Calif.; bids March 14.
350 tons, school, Warwick, R. I.; Rowley Construction Co., Pawtucket, R. I., general contractor.
350 tons, highway bridges, Iowa.
325 tons, bridge, Finlayson, Minn.
300 tons, building, Wilson & Co., Chicago.
275 tons, building for Gordon Strong, Washington.
265 tons, headquarters building, Fort Monmouth, N. J.; to be refigured.
250 tons, building, Fort Peck, Wiota, Mont.
225 tons, highway projects in addition to those already announced for Texas; bids March 5.
200 tons, government building, Aberdeen, Md.
200 tons, Fine Arts building, Des Moines, Iowa.
190 tons, Ravenna river bridge, Charlottesville, Va., for state highway department.
180 tons, state highway bridge, Saline, Kans.
150 tons, bridge over Flat Rock creek at Paulding, O.; bids to state highway commission, Columbus, O., March 16.
150 tons, school No. 37, Buffalo; bids March 27.
150 tons, bridge over Dry creek near Healdsburg, Calif., for Santa Rosa county; bids March 13.
150 tons, toll bridge repairs, Williamsport, Md.; bids March 14.
145 tons, building for Celanese Corp., Amcelle, Md.; Hazelwood Contracting Co., Cumberland, Md., low.
120 tons, highway bridges, Wyoming.
100 tons, addition to South Park high school, Buffalo; B. Rebescher & Sons, Buffalo, low for general contract.
100 tons, shapes and plates, 250,000-gallon elevated tank, Gretna, La.; bids March 27.

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POWER alone is not enough in a chain hoist. It must also possess the factor of positive safety.

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PHILADELPHIA DIVISION, Philadelphia, Pa.

Makers of Yale Electric Trucks, Hand Lift Trucks, Hand and Electric Hoists and Trolleys.

Reinforcing

Reinforcing Bar Prices, Page 49

Pittsburgh — Jones & Laughlin Steel Corp., Pittsburgh, has been awarded approximately 500 tons of bars for the Montgomery island dam. A Pennsylvania state highway letting for March 23 at Harrisburg, Pa., includes a job in Hanover township, Luzerne county, Pennsylvania, which requires 218 tons of bars. The mar-

Concrete Awards Compared

	Tons
Week ended March 10	5,760
Week ended March 3	4,524
Week ended Feb. 24	4,615
This week in 1933	5,250
Weekly average for 1933	3,771
Weekly average 1934	4,042
Weekly average, February	3,683
Total to date 1933	41,304
Total to date 1934	44,465

ket continues 1.90c for new billet steel bars for reinforcing work.

Cleveland — Small jobs appear more numerous. The Firestone Tire & Rubber Co. is taking bids for a service station here, requiring 200 tons of concrete bars; the roof to be of steel. Fisher Body Co. is preparing plans for an extension to its Cleveland plant, requiring 100 tons.

Chicago—While large awards are lacking, fair tonnages are noted in pending work, and production is expected to increase with the approach of milder weather and better activity in highway construction. Inquiries for private work are limited almost entirely to small lots. With the transfer of CWA activities to PWA April 1, additional construction work is expected to materialize. About 1200 tons of bars remain to be placed for two units of the Chicago sanitary district program. Billet bars continue 1.95c, with rail steel 1.80c.

Boston—Pending reinforcing steel requirements are smaller, although several hundred tons are about to come out for bridges and highway work in New England. A highway project, 200 tons, for Connecticut has been placed.

New York—Several hundred tons additional are up for New Jersey highway work, closing March 26.

Philadelphia—Orders for reinforcing material are fairly numerous, but tonnage is light. Cut lengths are unchanged at 2.19c, Philadelphia.

Contracts Placed

3000 tons, Boulder dam, Boulder, Nev., to Sheffield Steel Corp., Kansas City, Mo.; bids of Feb. 25.

1000 tons, Pacific-Continental Grain Co. elevator at Vancouver, Wash., to Pacific Coast Steel Corp., Seattle; Alloway & Georg, Spokane, general contractors.

500 tons, Montgomery island roller crest dam, Ohio river below Pittsburgh, to Jones & Laughlin Steel Corp., Pittsburgh; through Booth & Flinn Co., Pittsburgh.

350 tons, viaduct and highway work, Passaic county, New Jersey, to Joseph T. Ryerson & Sons Inc., New York; through Union Building & Construction Co., and J. E. Chapman & Sons; two contracts.

300 tons, high school addition, Bakersfield, Calif., to unnamed interest.

250 tons, highway, Vernon, Conn., to Truscon Steel Co., Youngstown, O.; through M. A. Gammino Construction Co., Providence, R. I.

209 tons, canyon bridges, highway No. 3, Terrell county, Texas, to North Texas Iron & Steel Co., Fort Worth, Tex.; through Palma & Lozier Co., general contractor.

200 tons, buildings, Albrook Field, C. Z., to unnamed interest.

200 tons, addition to Continental Can Co., plant, Los Angeles, to unnamed interest.

171 tons, state highway work in Gallaintin and Lake counties, Montana, to unnamed interests.

100 tons, bridge, Henry, Ill. ,to Concrete Steel Co., Chicago.

100 tons, building, Ford Motor Co., World's fair, Chicago, to Truscon Steel Co., Youngstown, O.

100 tons, or more, bars and shapes, field and company quarters, Barksdale Field, Shreveport, La., to Truscon Steel Co., Youngstown, O., and Decatur Iron & Steel Co., Decatur, Ala.

100 tons, bars and shapes, officers' mess building, Barksdale Field, Shreveport, La., to Jones & Laughlin Steel Corp., Pittsburgh, and Birmingham Ornamental Iron Co., Birmingham.

100 tons, bridges, Appling county, Georgia, to Dudley Bar Sales Co., Birmingham, Ala.; through W. F. Scott, Thomasville, Ga.

100 tons, railroad bridge, Missouri river, Fort Peck dam site, Wiota, Mont., for federal engineer at Kansas City, Mo., to Kalman Steel Corp., Bethlehem, Pa.; through Massman Construction Co.

Unstated tonnage, addition, pump house, Washington, to Dietrich Bros., Baltimore.

Contracts Pending

555 tons, additional requirements for

DIAMONDETTE STEEL DECKS FOR UNCLE SAM'S SAILORS

Permanence *with safety* is a "buy word" in the Navy. "A W" floor plate conforms to Government standards and specifications. Gangways, runways, landings, cross overs, floors and ladder steps on Uncle Sam's battle wagons call for a lasting, protecting covering that insures safe footing and steady sailors ready for any emergency. • Alan Wood floor plate in the safe and scientific *Diamond* and *Diamondette* patterns—in ferrous or nonferrous metals meets all requirements. • This same quality material is at *Your* service—for *any* service where protection and long life are vital considerations.

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highway projects previously announced by Texas, mainly in Collin and Tarrant counties; bids March 5.

525 tons, New Jersey state highway projects; bids March 26.

300 tons, school No. 37, Buffalo; bids March 27.

218 tons, paving work and two reinforced concrete structures, Hanover township, Luzerne county, Pennsylvania; bids of Feb. 23 rejected and new bids asked for March 23.

200 tons, John Marshall high school, Rochester N. Y.; bids March 14.

200 tons, service station, Firestone Tire & Rubber Co., Cleveland; bids being taken.

150 tons, specification No. 23,096-A, Boulder dam, Boulder City, Nev.; 20 firms submitted identical bids at 2.86c.

135 tons, eight structures on N street, Sacramento, Calif., for state; bids March 21.

125 tons, various projects; bids to state highway commission Columbus, O., March 16.

100 tons, addition to South Park high school, Buffalo; B. Rebescher & Sons, Buffalo, low for general contract.

100 tons, extension to plant of Fisher Body Co., Cleveland; plans being prepared.

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Unstated tonnage, concrete paving work, Lackawanna county, Pennsylvania; F. D. Kessler Inc., Northumberland, Pa., low at $176,905.

Strip Steel

Strip Prices, Page 49

Pittsburgh—Strip buyers were informed last week of an unchanged second quarter market on hot-rolled and cold-rolled strip at Pittsburgh. This means that 1.75c, Pittsburgh, on hot-rolled strip and 2.40c, Pittsburgh and Cleveland, on cold-rolled will continue into April. A few inquiries were out last week for second quarter.

Cleveland—With prices unchanged for second quarter, consumers still are reluctant to sign contracts in which there is a clause protecting the seller in event government regulations further increase costs. Caution also has been engendered by the recent temporary reduction in hot-rolled strip at Chicago and the rescinding of an announced reduction at Pittsburgh before it went in effect. This, however, has not interrupted the steady flow of specifications for delivery this month, with current demand almost entirely represented by automotive requirements.

Chicago—Strip steel shipments still tend upward, aided by expanding automotive requirements. While this industry accounts for the largest individual tonnages, demand elsewhere is improving gradually. Producers quote 1.85c, Chicago, for second quarter business in hot strip, with cold-rolled unchanged at 2.40c, Pittsburgh-Cleveland.

Boston—Cold strip buying shows little improvement, although some gains are noted in requirements for auto partsmakers and some industrial plants making consumer goods. Cold strip is unchanged at 2.60c, Worcester, Mass.

Philadelphia—Steel strip buying is expanding slowly and prices are unchanged.

Wire

Wire Prices, Page 49

Pittsburgh — Opening of second quarter books by wire producers at prices unchanged from first quarter, has caused little comment, in view of an absence of forward buying and a similar announcement earlier by wire sellers at other producing points. The market continues $2.35 per keg on nails and 2.20c on plain

wire in carloads. Although present demand runs ahead of both February and January, movement to jobbers so far this season has been disappointing.

Straight car load lots of cut nails are $2.75 per keg, base, Pittsburgh, with 10 per cent discount allowed on size extras. Less-carloads, five kegs or more, are $3.05, with no discount on size extras; and less than five kegs, $3.20, with no discount on size extras, as noted in STEEL's price table, page. 49.

Cleveland — Wire and wire products tonnage booked here during the week was the second largest of any week this year, falling short of setting a new mark by a narrow margin. A good miscellaneous demand is noted and some contracts have been booked for second quarter.

Chicago—Wire specifications and shipments continue fairly active, while second quarter business so far is light. Consumption is spotty, requirements of the automotive industry showing further expansion, while demand from farm districts is light, even for this period. With second quarter prices unchanged from current levels, buyers are slow to make commitments. The market remains $2.40 for wire nails and 2.25c for plain wire.

Boston—Demand for wire is barely holding to the recent rate. Operations have dropped at several drawing mills. Plain wire is steady at 2.30c, Worcester.

New York—Although wire consummers and jobbers stocked heavily at the close of last year, and consumption has increased only moderately, increased buying is expected soon.

Philadelphia—Jobbers appear well stocked with wire products and mills find little increase in buying by manufacturers.

Pig Iron

Pig Iron Prices, Page 50

Pittsburgh—With demand still confined to carload lots, merchant furnace producers are having difficulty scheduling operations except where iron is being moved to ingot mold and steel mill roll makers. Radiator manufacturers in this district have been buying occasionally but are not stocking iron. If the price of scrap continues to rise, several nonintegrated steel mills here, which ordinarily would use basic pig iron, may find it profitable to turn to the use of iron again. Under the recent reduction of basic plus the allowable 60-cent per ton deduction, one leading basic account here can obtain iron for $17.50, delivered.

Cleveland—Since March 1 when books for second quarter were opened a leading lake merchant furnace interest has taken approximately 22,000 tons, some for delivery this month. Contracting is not brisk, the two leading automobile manufacturers being well supplied with iron, though partsmakers are more active, and sales of malleable iron especially have improved. The volume of shipments continues to increase moderately. Producers point to higher coal prices which will be in effect April 1 when their first quarter contracts expire.

Chicago—Recent activity indicates March shipments will be 30 to 50 per cent heavier than in February. New business continues fairly active, some orders for March delivery. In practically all instances second quarter bookings received to date are heavier than those placed for first quarter. Foundry schedules con-

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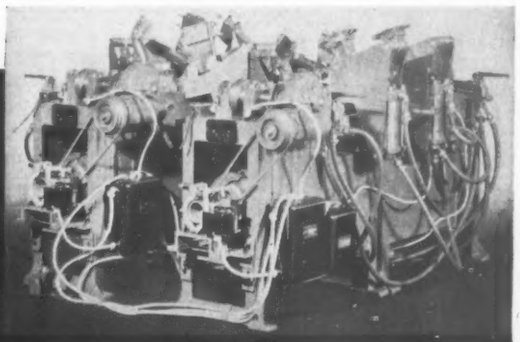

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tinue to improve moderately, although steel foundry operations remain light. Production still is restricted at some Wisconsin plants by strikes, although this situation has not spread during the past week. Prices are unchanged at $17.50, furnace, for No. 2 foundry and malleable. While this price has been continued on second quarter contracts, possibilities of further increases in costs give indications that higher prices are not unlikely next quarter.

Boston—Pig iron business is largely in scattered car lots against contracts. There has been little new buying and foundry melt has not picked up enough to furnish much additional volume to sellers. General Fire Extinguisher Co., Providence, R. I., is reported inquiring for 650 tons of foundry iron.

Philadelphia—Consumers are showing little interest in forward requirements, but a number of foundries are specifying somewhat more freely for spot needs.

St. Louis—Buying continues in fair volume and shipments are exceeding previous expectations. Some small foundries which had not covered earlier due to stringent credit conditions are now entering the market. Books of both northern and southern iron sellers have been opened for second quarter at unchanged prices.

Birmingham, Ala.—Conditions in the market are unchanged from recent weeks, most buying being in small lots. Labor trouble in nearby coal mines threatens coke production, but furnace interests are not perturbed as they have both iron and raw material in stock. Prices are unchanged.

Buffalo—Shipments from Buffalo stacks in the first ten days of March were 15 to 20 per cent in excess of those of the corresponding period of February. Buying has broadened since the opening of second quarter books.

Toronto, Ont.—While no future delivery contracts for pig iron have been booked, melters are taking larger tonnages than formerly. Production is holding around 30,000 tons per month.

Cincinnati—Consumers are slow in covering second quarter needs although purchasing for early requirements has improved. Some important melters are operating on iron bought in December.

New York—While second quarter contracting has not yet developed, small-lot buying has improved. No evidence is reported here of eastern producers of low-phosphorus iron following the reduction of $4 to $19 at Johnson City, Tenn., effective March 17.

Coke By-Products

Coke By-Product Prices, Page 49

New York—Naphthalene in barrel lots has been reduced in the East to 6 cents per pound, and in 50-pound cartons to 6½ cents. Western prices carry a half-cent higher differential.

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Scrap

Scrap Prices, Page 51

Pittsburgh—Buying interest by consuming mills is not marked but No. 1 heavy melting is up 25 cents on the basis of a $14.50 purchase late last week. The situation at Youngstown, O., has drawn most of the market's attention, where No. 1 heavy melting steel is $1 higher than at Pittsburgh, and where No. 2 steel is at about the same level as No. 1 steel at Pittsburgh. Last week the Baltimore & Ohio railroad disposed of about 600 tons of its scrap list at just under $15.

Cleveland—Steel producers have made heavy drafts on scrap reserves and shipments are being urged. Further buying is imminent and this gives the market added strength. Gray iron foundries are irregularly busy but malleable shops are consistent buyers of scrap.

Chicago—Scrap buying the past two weeks has been the heaviest so far this year and both demand and prices reflect increasing consumption and the favorable outlook. Fairly large tonnages of heavy melting steel were sold at $12.25. One sale was reported at $12.50 and dealers are paying more than $12 in covering, with railroad sales bringing as high as $13. Quotations on a number of other grades have accompanied the recent upturn in heavy melting steel. While higher prices are bringing out more scrap, shipments into consumption also have risen.

Boston—Scrap prices are firm with further advances on several grades. The higher prices in the more active grades apply to outside shipments, notably a Pittsburgh delivered base, as New England consumers are generally paying less. Movement of scrap has improved slightly.

New York—Heavy melting steel prices for barge loading have advanced 50 cents, dealers now paying $9.50 for No. 1 and $8 for No. 2. These prices are reported to have been bettered in some instances. Eastern district steel works are taking slightly heavier shipments.

Philadelphia—While Bethlehem Steel Co. has added to its purchases of heavy melting steel for Sparrows Point, Md., bringing recent orders for that point to 17,000 tons, general domestic scrap demand here is spotty. Prospects for domestic improvement and continued export inquiry are imparting strength and some advances have been made. An inquiry from Austria for 3000 tons of steel scrap is current.

Buffalo—A local consumer has pur-

chased from a Detroit producer 2000 to 3000 tons of new bundled sheets. It is reported the contract was made at $11.50, delivered at Buffalo docks after the opening of navigation. At this rate No. 1 heavy melting steel would be worth $13 at Buffalo, but principal melters have refused to advance their offer of $12 a ton, and nothing is being sold.

Detroit—Although scrap production is heavy and increasing, a local consumer which has been out of the market for several months began taking material last week because of an increased open-hearth schedule, and a lake mill which will receive scrap as soon as transportation opens bought hydraulic compressed bundles. These two facts, plus strong demand from districts drawing on Detroit for scrap, have forced the markett up 25 to 50 cents. No. 1 heavy melting steel now is quoted $10.50 to $11 and hydraulic compressed sheets $10.75 to $11.25.

Cincinnati—Further advances have been made in iron and steel scrap quotations. The dull mill demand here, retarding price increases, enabled dealers to find profit in sales to valley consumers.

St. Louis—All grades of iron and steel scrap continue strong, steel making items being firmest. Mills are gradually increasing operations and are in need of raw materials.

Birmingham, Ala.—Conditions are unchanged in the steel and iron scrap market and only small sales are being made. Steelmakers are taking shipments steadily.

Toronto, Ont. — Trading in iron and steel scrap is broadening, with more grades becoming active. Steel scrap is said to be moving to the Hamilton mills. Iron grades, however, are responsible for most of the improvement and dealers report shortage in some lines.

Warehouse

Warehouse Prices, Page 52

Pittsburgh — Proposal to include all of Allegheny county within the Pittsburgh switching limits on warehouse steel products is being considered. At present, prices in Pittsburgh proper are ten cents less than the out-of-town rate, which has worked inequalities against mill shipments. Warehouse steel demand in March is about comparable with the first week in February with prices unchanged.

Cleveland—The number of orders, as well as tonnage has increased. Improvement especially is noted in sheets, as mills are booked heavily. Prices are unchanged, though it is expected hot-rolled alloy steel bars will be adjusted in line with recent revisions at Chicago, St. Louis and other middle western cities. Efforts are being made by trade union organizers to establish unions in some warehouses here.

Chicago—Sales are slightly heavier than in February both in number of orders and tonnage. Base prices on hot-rolled alloy steel bars have been revised, with new quantity extras adopted, resulting in higher net prices generally.

Philadelphia—Warehouse tonnage has shown little variation in three months but seasonal influences are expected to bring improvement soon. Prices are steady.

Cincinnati—Demand for steel from warehouses is showing a seasonal increase but lacks the vigor of times when building was active. Revisions in alloy steel bars are effective.

Detroit — Demand for warehouse steel has sustained the February rate, which was considerably better than January. Carriage and machine bolts in case lots now are quoted 65 off list with less-case lots 60 off. An adjustment in common and cement coated nails makes the market $2.90 per keg. Stretcher-leveled sheets out of warehouse were advanced $5 a ton last week and cold-rolled sheets $3 a ton.

St. Louis — Average volume of warehouse business this month compares favorably with the same portion of February. Moderate betterment is noted in demand for sheets, beams and angles from the rural areas.

Metals

Nonferrous Metal Prices, Page 50, 51

New York—An improved market tone was generally apparent in the nonferrous metals last week. Consumers placed more commitments and prices tended to lift slightly.

Copper—Buying was on a more active scale with the total volume the heaviest in a number of weeks. Consumers apparently are not as well covered as previously believed. Electrolytic metal was firm at 8.00c, Connecticut. Stocks are believed to have dropped at least 15,000 tons in February. Extensive foreign buying has supported the market.

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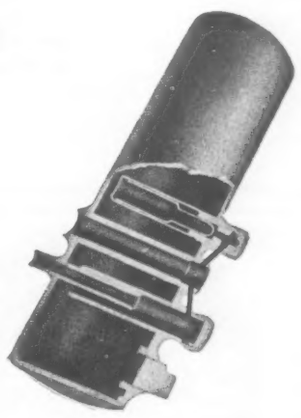

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the industry is improving with stocks reported to have dropped in February for the first time in a number of months. Buying has been in substantial volume.

Zinc—Demand for prime western metal has been quiet from all surface indications but specifications on contracts have expanded markedly. Metal was offered at 4.37½c Friday. Most sellers asked 4.40c.

Tin—Prices pushed up rapidly toward the close of the week due to a sharp rise in the London market. Straits was selling well above the 53-cent mark with spot and futures at about the same level. Buying improved.

Antimony—The market firmed up due to a stronger situation in the Far East. Demand continued light.

Aluminum — Secondary material showed less tendency to advance as the result of a softening in scrap. Virgin ingot showed little change.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 49

The bolt, nut and rivet market is stronger. Early March buying is ahead of the same period in February and the latter month for most manufacturers exceeded January. Though second quarter prices have not been formally announced at Pittsburgh there is no prospect of change from the present 70 off list for bolts and nuts and 2.75c, Pittsburgh or Cleveland and 2.85c, Chicargo, base, steady on large rivets.

Farm implement and automotive builders are taking more bolts and nuts from Chicago suppliers than are the railroads, although needs of the latter are growing. Jobbers and smaller users show increased buying.

At Cleveland nut and bolt demand from automobile manufacturers is the best since 1929. Specifications in general are at about the February rate. Contracts are being booked there for second quarter at unchanged prices.

The Pennsylvania is placing orders for bolts, nuts and rivets for 3000 freight cars, with 3500 cars not yet covered.

Metallurgical Coke

Coke Prices, Page 49

The market on furnace grades of beehive coke is active but only moderate improvement is noted in foundry coke. By-product coke shipments to the Monessen, Pa., blast furnace from Neville Island have been heavy and also by-product and some beehive coke shipments from the Connellsville region to a Sharpsville, Pa., user.

By-product coke shipments at Chicago are benefiting from expanding foundry schedules and shipments this month are about 25 per cent heavier than in February. By-product foundry coke is $8.50 for outside delivery and $9.25, delivered, Chicago.

Demand for metallurgical coke is improving at St. Louis and shipments are heavier than in February. At Birmingham, Ala., demand is good and production holds its rate. Domestic heating requirements in the New York area make up for smaller needs of metallurgical users.

Equipment

Chicago—Inquiries for machinery and equipment recently have been more active than sales. Interest in miscellaneous types of machinery, including machine tools, has been fairly well diversified. Northern Pacific railroad is in the market for a 4-foot radial drill and lathe, but purchases by carriers generally are light. The same applies to freight car builders who have yet to start work on recent orders. Some government purchases have been made recently with a fairly large volume of various types of equipment, included in pending and prospective inquiries.

Cold Finished

Cold Finished Prices, Page 49

Pittsburgh—Base of 2.10c, Pittsburgh, on cold-finished carbon steel bars has been reaffirmed for second quarter. Basing points at Buffalo, Cleveland, Chicago and Detroit continue at the first quarter level. The five respective bases, by size, on turned and ground shafting at Pittsburgh will also continue unchanged into next quarter. Alloy cold-finished steel bars are 2.95c, Pittsburgh. The market on carbon and alloy cold-drawn, while better than in February, is not measuring up to expectations for early March.

Semifinished

Semifinished Prices, Page 49

The tin plate industry at Pittsburgh still leads among the semifinished steel buyers, shipment of tin bars supporting an 80 per cent rate of operations in the tin plate hot mills. Small nonintegrated sheet mills also are taking heavier tonnages of sheet bars, but billets are in slow demand. The market holds $26, Pittsburgh, for both sheet bars and billets, with wire rods $36.

Tin Plate

Tin Plate Prices, Page 48

Pittsburgh—The 80 per cent rate of tin mill operations was sustained in the Pittsburgh district last week,

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with a leading mill continuing at 85 per cent. Specifications from canmakers insure a steady rate for at least four weeks. Tin mill product prices continue unchanged, with 2.65c, Pittsburgh, reaffirmed for the second quarter on tin mill black sheets.

Pacific Coast

Pacific Coast Prices, Page 49, 50, 52

San Francisco—(*By Air Mail*)—Demand for steel products on the Pacific coast continues to improve and considerable new work has come up for figures. Plates and reinforcing steel bars are the most active. Interest centers around 3200 tons of piling for a bulkhead at Government Island, Calif., on which bids have just been opened.

Among the larger lots of reinforcing bars placed during the week were 333 tons for two state bridges in Los Angeles county, California, 245 tons for two bridges in Santa Barbara county, California, and 200 tons for an addition to the Continental Can Co. plant in Los Angeles. Bids have been opened on 2650 tons for two projects for Boulder dam. Pending business now exceeds 10,000 tons.

Hardie-Tynes Mfg. Co., Birmingham, Ala., took 250 tons of plates for compressors at Pearl Harbor, T. H., and Consolidated Steel Corp., Los Angeles, booked 160 tons of 24-inch welded pipe for the Escondido Mutual Water Co., Escondido, Calif. Redlands, Calif., will buy in the open market 402 tons of ¼ to 4-inch standard steel pipe.

Golden Gate Iron Works, San Francisco, took 100 tons of shapes for 91 trusses for the United States forest service, San Francisco. Among new inquiries are 356 tons of piling for a bridge project near Sacramento, Calif., and 150 tons for a bridge near Healdsburg, Calif. Bids have been opened on 2500 tons for a powerhouse at Pearl Harbor, T. H.

The only cast iron pipe award of size went to the United States Pipe & Foundry Co., 100 tons of 4 and 8-inch pipe for Daly City, Calif. Morgan Hill, Calif., has taken bids on 360 tons of 4 to 8-inch pipe. Long Beach, Calif., opened bids March 8 for 280 tons of ¼ to 4-inch standard steel pipe. Beverly Hills and Oakland, Calif., will open bids March 27 and March 14, respectively, for 120 tons and 119 tons.

Public Projects Lead

Seattle—Awards last week included 1000 tons of reinforcing bars taken by the Pacific Coast Steel Corp., Seattle, for a grain elevator at Vancouver, Wash., for the Pacific Continental Grain Co. Alloway & Georg, Spokane, Wash., have the general contract.

Alaska Railroad has purchased 154 tons of corrugated culvert pipe from the Pure Iron Culvert & Tank Co., Portland, Oreg. An order for ten air dump cars, 25 yards capacity each, has been placed with the Western Wheeled Scraper Co., Aurora, Ill. This railroad will open bids March 20 and 21 for 18 tractors and 13 road graders, all for shipment to Alaska.

Under the PWA program, Washington has listed 35 projects, including the $4,058,000 Tacoma Narrows bridge. Oregon has filed 31 projects totaling $19,365,000.

The wholesale jobbing trade is more active, February showing a gain over January, the first two months being far in advance of a year ago. Buyers are taking larger tonnages, plates, sheets and structurals being in best demand. Prices are firm. Cast iron pipe inquiry is slow but some fair inquiries are expected shortly. Many important water system extensions are planned by cities in this area.

If activity continues at its recent rate local steel mills may soon be in the market for scrap. Stocks of steel grades are low. Oriental buyers are interested and are looking for bargains. Rails are in particularly good demand.

Steel in Europe

Foreign Steel Prices, Page 52

London — (*By Cable*) — Pig iron continues to occupy a strong position in the domestic market and another furnace has been lighted. Trade is slower in sheet bars, owing to dullness in galvanized sheets. Merchant and structural steel demand is fair. South Africa has placed an interesting railroad track contract in England. Trade is improving in Scotland, especially for heavy steel. Somewhat better demand is being encountered for tin plate.

From the Continent comes report that export trade is fairly satisfactory, especially to the Far East. The cartel for wide flange beams has been completed and placed in operation.

Quicksilver

New York—Quicksilver prices are firmer here, the market ranging $75 to $76, a virgin flask of 76 pounds, and some asking prices on small lots $77 a flask.

Pittsburgh Lectromelt Furnace Corp., Pittsburgh, has installed a fourth Lectromelt furnace in the foundry of the Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich., for duplexing of cupola iron for crank and cam shafts.

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Men of Industry

(*Concluded from Page* 21)

tute of Scrap Iron and Steel. Other officers elected include: First vice president, H. N. Trimble, of H. N. Trimble Co., Pittsburgh; second vice president, Ike Wilkoff, of the Wilkoff Co., Youngstown, O.; and secretary, H. F. Stocker, of H. F. Stocker & Co., Pittsburgh.

□ □ □

Dr. E. C. Gilbert has been appointed general manager of the Perkins Machine & Gear Co., Springfield, Mass., succeeding F. H. Rich.

□ □ □

Robert J. Pardee, associated with the Toledo Machine Tool Co. for 17 years and lately with the Cleveland Punch & Shear Works Co., Cleveland, has resigned, effective March 5.

□ □ □

C. B. Murray, of Crowell & Murray, Cleveland, has been chosen a director of the American Institute of Mining and Metallurgical Engineers to represent the Great Lakes district.

□ □ □

H. A. MacMullan, formerly with Henry A. Hitner's Sons Co., Philadelphia scrap dealer, and one of the founders of the Institute of Scrap Iron and Steel, is now associated with the Northern Metal Co., Philadelphia, in recent years prominently identified with the dismantling of ships.

□ □ □

Eyvind W. Peterson, Rockford, Ill., has been appointed representative in the Chicago-Milwaukee district for the St. John X-Ray Service Inc., Long Island City, N. Y. At one time he was associated with the Doehler Die Casting Co., Toledo, O., and for the past 11 years has been metallurgical engineer for Fairbanks, Morse & Co., Beloit, Wis.

□ □ □

Herbert A. Stanton, European manager of the Norton Co., Worcester, Mass., has returned to his London, England, office after a short visit in this country.

Michel Biscayart, Compagnie des Meules Norton, Paris; Otto Schutte, Deutsche Norton Gesellschaft, Wesseling, Germany; and William Haddock, Norton Grinding Wheel Co. Ltd., Welwyn Garden City, England, also have been visiting the home office and have now returned.

□ □ □

T. W. Burns has resigned as works manager of the main plant of Fairbanks, Morse & Co. at Beloit, Wis., to join the executive staff of the A. O. Smith Corp., Milwaukee, as assistant to W. C. Heath, vice-president and general manager of manufacturing, who held the same office with Fairbanks, Morse before becoming identified with the Smith corporation two years ago. Mr. Burns had been with Fairbanks, Morse for 27 years.

R. E. Saveland, a Fairbanks, Morse & Co. executive since 1928, most recently as assistant to Mr. Burns, has been appointed general superintendent of shops.

George Zabel has been appointed foundry superintendent and continues in charge of the department of chemistry.

Heinrich Schneider has been named general chief engineer, and M. B. MacNeille chief engineer of the hydraulic and diesel division.

Died:

(*Concluded from Page* 20)

Cleveland which was operated by the Hanna interests, remaining till 1926.

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Harold A. W. Manard, 49, president of the Manard Machinery Co., Denver, in that city, Feb. 25.

□ □ □

Hanson B. Tyler, superintendent of the enameling plant of the Lisk Mfg. Co., metalware and specialties, Canandaigua, N. Y., in that city recently.

□ □ □

John C. L. Ward, 67, founder of Stimple & Ward Co., Pittsburgh, manufacturer of armature coils, in Ft. Lauderdale, Fla., recently.

□ □ □

G. F. Royer, president, Royer Foundry & Machine Co., Wilkes-Barre, Pa., manufacturer of sand separating and blending equipment, March 4.

□ □ □

Frederick W. Baumgarth, 75, for more than 30 years identified with Buhl Stamping Co., Detroit, where he supervised the tool and die making department, in Detroit, March 4.

□ □ □

John A. Donaldson, 69, vice president of the Pittsburgh Coal Co. from 1912 to 1927 when he retired, at his home in Pittsburgh, March 4.

□ □ □

Herman Behr, 86, formerly president of Herman Behr & Co., sandpaper manufacturer, at his home in New York, March 7. He retired in 1928 when his company was merged with the Manning Co., Troy, N. Y., to form the present Behr-Manning Corp.

□ □ □

Francis E. Tyng, 66, New York representative of the Euclid Armington Corp., Euclid, O., hoisting machinery manufacturer, at his home in Norwalk, Conn., March 7. At one time he was associated with the old Thomson Houston Electric Co., Lynn, Mass., and Schenectady, N. Y. Subsequently he became an employe in the laboratory of Thomas A. Edison, assisting in the development of a number of inventions. Later he had charge of the crane department of Manning, Maxwell & Moore Inc.

□ □ □

Thomas J. Gillespie, 86, president of the Lockhart Iron & Steel Co., Pittsburgh, in that city, recently. Born in County Down, Ireland, in 1847 he came to this country at an early age and first resided at New Castle, Pa. Later he was one of the firm of the Central Refining Co., taken over by the Standard Oil Co. a few years later, at which time Mr. Gillespie continued in their employment at Cleveland. In 1890 he returned to Pittsburgh to become general manager and secretary of the Lockhart company.

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Cincinnati Worcester Buffalo

Here and There In Industry

CHAIN BELT CO., Milwaukee, has completed transfer to its Milwaukee plant of manufacturing operations of its wholly-owned subsidiary, Stearns Conveyor Co., Cleveland. The last operation to be moved was the department producing belt conveyor idlers. Chain Belt Co. acquired the Stearns comany in 1926. L. B. McKnight, formerly secretary and sales manager of the Stearns company, is manager of conveyor sales, and George M. Dyke, vice president and operating manager of the Stearns company, will be associated with the parent company in an executive capacity.

□ □ □

Southern States Industrial council has been organized at Birmingham, Ala., with J. E. Edgerton, Lebanon, Tenn., president. The organization will seek to obtain better representation on NRA code authorities and a wage differential to aid the South. R. C. Stobert, vice president of the Hardie-Tynes Mfg. Co., Birmingham, Ala., has been made treasurer and C. D. Barr, vice president of the American Cast Iron Pipe Co., Birmingham, Ala., is a director.

□ □ □

Ashmore, Benson, Pease & Co. Ltd., representative in England for William M. Bailey Co., Magee building, Pittsburgh, has taken an order from the Babcock & Wilcox Co., New York, for two single-tube and two three-tube thermal expansion valves for installation in the plant of the Ford Motor Co. in England.

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Landis Machine Co., Waynesboro, Pa., has changed the name of its Victor plant at Waynesboro to Landis Machine Co. tap division. The change is made because a new line of collapsible taps, designated as the Landis, has superseded the older line of Victor taps and the latter has been discontinued.

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Concrete Reinforcing Steel institute, the code authority for that industry, is moving its headquarters from 333 North Michigan avenue, to 201 North Wells street, Chicago, effective Feb. 26. New headquarters are in the tallest reinforced concrete combination framed building in the world, the Trustees building.

□ □ □

Bundy Tubing Co., 10951 Hern avenue, Detroit, manufacturer of hydrogen-welded steel tubing, has organized a subsidiary, H. W. Bundy Inc., to take over the commercial parts production of the parent company other than tubing. This includes custom welding of parts supplied by other manufacturers ready for welding and complete production of finished parts. General offices will be in the plant of the Bundy Tubing Co. Production will be at the former plant of the parent company at 4815 Bellevue avenue. W. W. Anderson is president, T. M. Rude vice president, A. C. Winger secretary and treasurer, and H. J. Blair superintendent.

□ □ □

City Machine & Tool Works, Dayton, O., has bought the Paulins Tool & Engineering Co., Detroit, manufacturer of standard drill jigs and locks, and is manufacturing an improved line of standard drill jigs and locks under the trade name of Cimatool-Paulins. Stocks will be maintained at the factory at Dayton and at the Detroit office, 410 Stormfeltz-Loveley building, 7310 Woodward avenue. Frank S. Paulins will remain with the Detroit office in an engineering and sales capacity.

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Bethlehem Steel Co., Bethlehem, Pa., has reproduced, with few exceptions, the book of "Uniform Extras and Deductions," issued by the American Iron and Steel institute Dec. 1, 1933. This book, in a loose-leaf binder and with index tabs, has been prepared for distribution to customers of Bethlehem Steel Co. It includes extras and deductions applying to all products made by that company. It is the company's plan to provide new pages from time to time for users of these books.

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Pacific Car & Foundry Co., Seattle, has been reorganized by Paul Pigott and associates, who recently purchased it from the American Car & Foundry Co., which had owned it for ten years. It was formed in 1907 by William Pigott to manufacture railroad and logging equipment, castings and fabricated structural material. Paul Pigott has been elected president, H. N. Curd, vice president and general manager, William Pigott Jr., vice president and treasurer, and W. S. Bassage, secretary.

□ □ □

Gray Iron Founders' Society Inc., Cleveland, sponsor of a code of fair competition for gray iron jobbing foundries, has taken larger office space on the tenth floor of the Public Square building, 33 Public Square, Cleveland. A code authority is being constituted, consisting of six members of the board of directors of the society and two representatives of non-members, with three representatives of the administration. The six director-members of the code authority are: F. R. Hoadley, G. D. Branston, C. B. Magrath, W. A. Rigsby, A. B. Root Jr. and W. H. Winters. Balloting on representatives of non-members is in progress.

GOOD USED EQUIPMENT

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FORGING INDUSTRY
MACHINE SHOPS
POWER PLANTS
ROLLING MILLS
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STRUCTURAL, BOILER and TANK INDUSTRY

AIR COMPRESSOR—3000 Cu. Ft. 100 lb. pressure. Plate Valve. Two Stage. Cylinder sizes 32″ & 19″ x 24″. Direct driven motor on shaft, 600 HP, 3 ph., 60 cy. G-E Synch. Belted Exciter. Complete operating panelboard. Latest type. Used about one year. Price about 25% of replacement cost.
BENDING ROLL—10′ 2″ CLEVELAND Pyramid Type. 1/2″ capacity. Rolls 11″ and 8″ dia. Drop end housing. Motor Drive.
BULLDOZER—No. 28 Williams, White, motor drive, without motor.
CRANE—5-Ton SHEPARD Overhead Electric Traveling, 52′4″ span, 230 v. DC, also equipped for bucket & magnet operation. 350 feet of Double "A" Frame Runway.
FORGING MACHINES—AJAX, NATIONAL, ACME, Steel Frame, Late Type, Motor Drive, Sizes 1 to 5″.
FORGING PRESS—1000-Ton Steam Hydraulic, complete with Pumps, Accumulator, etc.
FURNACE—500-Lb. MOORE Rapid 'Lectromelt for electric steel melting, 3 ph. with complete electrical equipment including Transformer, 2200 to 120 v. AC.
GENERATOR—TURBINE—G-E Type ATB-2-1875 KVA 3600, Form T, Amps. 2463, Speed 3600, KW 1500, 60 cy., 440 volt. Direct connected to—Curtis Steam Turbine, KW 1500, Speed 3600, Form A, 3 stage, 210 lb. steam pressure, non-condensing.
PRESS—BLISS No. 6-1/2 Straight Side, Double Crank with spring counterbalance. Belt Drive. 54″ between housings. 8″ stroke.
BLISS No. 25½-H, 96″ Double Crank Gap Frame, AC MD and mot. adj. 6″ shaft, 33 strokes per min.
ROLL FORMING MACHINE—YODER Type H-820, direct connected MD, roll displacement 11″.
SHEARS—No. 10 BUFFALO for bars and shapes, cap. up to 3-7/8″ rounds and corresponding duty in other shapes. Direct con. AC MD with motor.
TESTING MACHINE—50,000-lb. RIEHLE Universal, MD. Rebuilt by mfrs. and guaranteed for accuracy.
WHEEL PRESSES—300 and 400-ton CALDWELL Hydraulic. 48″ bet. parallel bars. Direct motor driven with AC motor and Triplex Pump, Jib Crane and Hoist.
150-ton CALDWELL Hydraulic. 38″ bet. parallel bars. With 2-plunger hydraulic pump. Belt driven.

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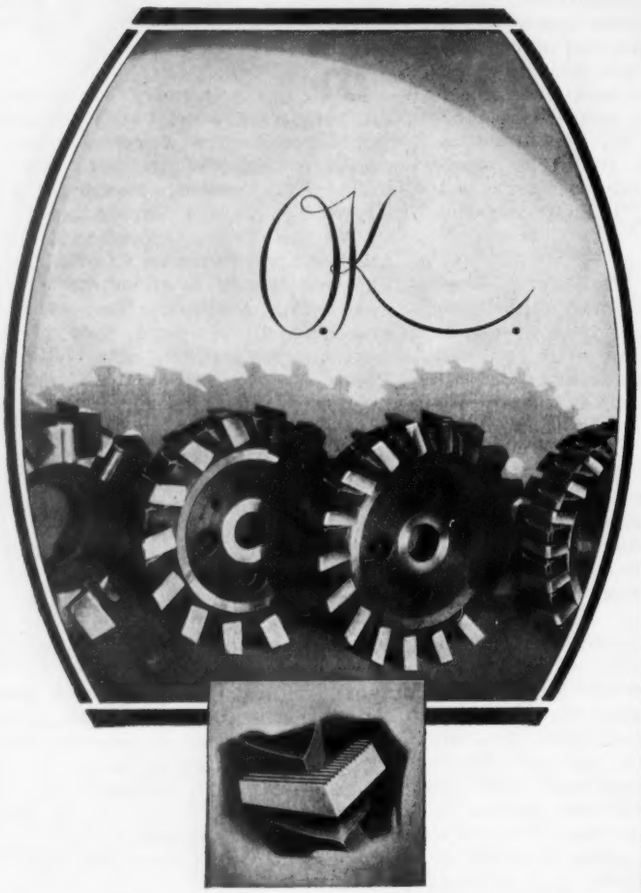

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New Trade Publications

PUMP—John Robertson Co. Inc., 133 Water street, Brooklyn, N. Y., in a current bulletin describes its high-pressure hydraulic pump, with tables of dimensions and specifications and illustrations of details.

MACHINE TOOLS—National Automatic Tool Co., Richmond, Ind., has issued a bulletin on several models of its self-contained hydraulic units for use with standard equipment. Illustrations, text and specifications are supplied.

GAGES—A gage manual has been prepared for distribution by the Sheffield Machine & Tool Co., Dayton, O., in looseleaf form. It contains information of value in production of work that must be held to gaging tolerances.

PUMPS—Worthington Pump & Machinery Corp., Harrison, N. J., has issued two bulletins, one covering modern centrifugal pumps of the monobloc type for brewhouse and cellars, the other dealing with rotary pumps, especially for use with oils.

STEEL—Inland Steel Co., Chicago, has issued a new edition of its booklet on the making of steel. This is written in non-technical language, easily understood by a school child and describes the entire process of steelmaking. It is illustrated. The booklet has had wide use in schools.

FASTENINGS—Parker-Kalon Corp., 200 Varick street, New York, has issued the fourth edition of its booklet on fastenings designed for attaching various materials, bringing this subject to date. Four new products perfected since the preceding edition are described.

COLLAPSIBLE TAPS—Landis Machine Co., Tap Division, Waynesboro, Pa., is distributing two bulletins giving detailed information and complete specifications of the new Landis collapsible taps. Bulletin No. G-83 covers style LT collapsible tap for straight tapping and No. G-81 style LM receding chaser collapsible tap for tapered work.

FORGING MACHINE—Under the general subject of what a modern forging machine is a booklet has been prepared by National Machinery Co., Tiffin, O. It describes the company's line of high-duty forging machines. It is well illustrated and shows complete machines and details, as well as products turned out by their use.

HOISTS—Use of single and double-drum electric tugger hoists is covered in a 38-page catalog, No. 1860-B, of the Ingersoll-Rand Co., 11 Broadway, N. Y. Tugger hoists are used widely with scrapers for slushing and loading ore and coal in mines and quarries and for pulling cars. The bulletin furnishes many suggestions for use of these devices. It is well illustrated.

NEW YORK HARBOR MAP—A revised, comprehensive railroad terminal map of New York harbor has been issued by the Port of New York Authority for guidance of traffic managers, shippers and others using freight-handling facilities of New York harbor. The map is 50 x 38 inches, suitable for hanging. Copies are free at the port authority offices, 111 Eighth avenue, New York.

PUMPS—Roots-Connersville Blower Corp., Connersville, Ind., has issued bulletin 60-B10 describing a line of rotary pumps built on the two-impeller principle, with two and three-lobe impellers, depending upon the type of service to which they are applied. The pumps are built for heavy duty service, including the handling of viscous liquids, for producing vacuums, handling air and liquid simultaneously, etc.

FLOW METERS—Catalog No. 700 has been issued by the Republic Flow Meters Co., 2240 Diversy Parkway, Chicago. It describes the principle of the electric resistance type of flow measurement and gives an illustrated description of the cartridge sealed element principle of the instrument mounting wherein each actuating mechanism is mounted individually as a separate sealed element which may be removed without disturbing the other element. It is fully illustrated.

SYNCHRONOUS MOTORS—A new bulletin, No. 1165, has been prepared by Allis-Chalmers Mfg. Co., Milwaukee, illustrating and describing its line of bracket bearing synchronous motors. In addition to the standard line for general requirements, including exciters, control equipment and other accessories, the bulletin treats of motors with special features of construction, such as anti-friction bearings, enclosed collector rings, splashproof type, enclosed fan-cooled type and vertical motors. Use of the synchronous motor for improvement of power factor is discussed.

Construction and Enterprise

New England

CAMBRIDGE, MASS.—A merger of Cutler Mfg. Co. and J. P. Eustis Mfg. Co. has recently been announced. The Cutler company specializes in fireplace furnishings and ornamental iron, copper and brass.

CHELSEA, MASS.—Board of trustees of the soldiers' home at Chelsea plans extensions and improvements to its powerhouse and to add to its equipment. A fund of $90,000 has been obtained. Coolidge, Shepley, Bulfinch & Abbott, 1 Court street, Boston, are architects.

PLYMOUTH, MASS.—Atlantic Refining Co., C. H. Ehlers, 250 South Broad street, Philadelphia, plans to construct a bulk oil terminal, including steel tanks, pump house and other accessories, to cost over $18,000.

New York

LOCKPORT, N. Y.—Equipment of the Covert Gear Co. plant will be sold March 22 and '23, liquidation in charge of Industrial Plants Corp., Columbus, O.

LONG ISLAND CITY, N. Y.—Flemm Lead Co., Thirty-first place and Bradley avenue, has plans by J. Baker, architect, 10-09 Jackson avenue, Long Island City, for plant alterations and additional equipment, to cost about $30,000.

NEW YORK—Hush Machinery Corp. has been incorporated to deal in machinery and tools, by G. B. Loey, 271 Madison avenue.

SYRACUSE, N. Y.—Purchase of the Oswego plant of the Ames Iron Works is being considered by the Pierce, Butler & Pierce Corp., Syracuse, manufacturer of heating devices, etc. Stewart F. Hancock, Hills building, Syracuse, will be secretary.

New Jersey

PAULSBORO, N. J.—Sandura Co. Inc., Finance building, Philadelphia, plans to rebuild its burned linoleum plant and will install electrical power equipment and motors, total cost to be $500,000. Robert Stewart is superintendent.

Ohio

CINCINNATI — Frank Automatic Bending Co. has been organized by Alphonse G. Reisenberg to build and operate machines for bending tubes, rods, pipes, etc., in association with the Crescent Tool Co., 201 Elm street, Cincinnati.

CLEVELAND—Winton Engine Co., 2160 West 106th street, manufacturer of automobile engines, will install electric motors, conveyors and similar equipment in its 1-story, 65 x 200-foot addition. A. E. Rowe, 1291 East 133rd street, is engineer.

Michigan

DETROIT—Refrigeration Seal Co., 1059 Beaufait avenue, has been incorporated with capital of $1000 to manufacture seal metal, by William B. Walker Jr., 1055 Balfour road.

DETROIT — Parker-Wolverine Co., 5203 Martin avenue, has been incorporated with $120,000 capital to deal in enameling metal, by William Cornelius, 2177 East Milwaukee avenue.

DETROIT—General Steel Treating Co., 1036 Beaubien street, has been incorporated with capital of $50,000 to do treating of metals and steel, by Peter Kypros, 606 Canto avenue.

HOUGHTON, MICH.—A. Haas Brewing Co. will expand and improve its brewing plant and will add tanks, power equipment and mechanical devices. Capital has been increased from $100,000 to $175,000 to provide funds.

MARSHALL, MICH.—Rex Anderson has been awarded contract for factory addition to the plant of the Brooks Appliance Co. Howard Young, Kalamazoo, Mich., is architect.

SAGINAW, MICH.—Francis Engineering Co. has concluded preliminary plans for erection of water works system in Richland ,to cost about $20,000.

SAGINAW, MICH.—Cowles & Mutscheller, architects, are preparing plans for a brewery at Center and River streets, at a cost of about $300,000, for the Saginaw Premier Brewing Co.

SODUS, MICH.—Board of trustees of Sodus Fruit Exchange plans to rebuild its cold storage and refrigeration plant, recently burned, at cost of $45,000.

Indiana

ALBANY, IND.—Interstate Machine Tool & Engineering Inc. has been incorporated with 100 shares no par value to manufacture machinery, by Lloyd W. Easter, H. E. Humphreys and associates.

GOSHEN, IND.—Plans are nearly ready for a waterworks system, including a 500,000-gallon steel tank and tower, two gas or diesel pumps and three electric pumps. C. Brossman, Chamber of Commerce building, Indianapolis, is engineer.

INDIANAPOLIS,—Indiana Metal & Machinery Co., 812 East Washington street, has been incorporated to deal in machinery and electrical supplies, by Bertha Fleig, Rosa Wohlfeld, Abraham Fleig, and Edward J. Wohlfeld.

TELL CITY, IND.—Krogman Distilling Co. plans to build a distillery to cost more than $40,000.

Illinois

ALTON, ILL.—City is having plans made for a water supply system to cost $1,850,000, PWA loan and grant having been approved. Burns & McDonnell, 107 West Linwood avenue, Kansas City, Mo., is engineer.

CHICAGO—J. P. Hansen Foundry Co., 1749 Ballou avenue, has been incorporated to manufacture castings, dies and other metals and metal products, by J. P. Hansen, P. T. Driscoll and K. K. Wildman. Corespondent M. G. Kaufman, 111 West Monroe street.

CHICAGO—Campbell Soup Co., Camden, N. J., will install electric equipment in its five-story and two-story additions to its plant here, entire cost estimated at $750,000.

CHICAGO—Chicago Great Western, 122 South Michigan boulevard, plans installation of electrical equipment, hoists and other mechanical devices in its remodeled engine repair shops at Oelwein, Iowa, at cost of $100,000. Company's engineering department is in charge.

CHICAGO—National Clock & Mfg. Co., 928 Fullerton avenue, has been incorporated to manufacture clocks and novelties, and machinery and equipment pertaining thereto, by H. E. Soyke, J. S. Evans and H. E. Doering. Correspondent: Phillip Gothberg, 1020 Chicago Temple building, 77 West Washington street.

GEORGETOWN, ILL.—City will take bids soon for a waterworks plant and distribution system, PWA loan of $140,000 having been approved. Consoer, Older & Quinlan, 205 West Wacker drive, Chicago, are engineers.

Southern

WASHINGTON—Bureau of supplies and accounts, navy department, will open bids March 16, schedule 1845, on two motor-driven turret lathes and equipment for delivery at Puget Sound Wash.; schedule 1863, on one precision bench-type lathe; schedule 1868, on one motor-driven automatic screw machine; schedule 1869, on one motor-driven multiple spindle drill press; schedule 1870, on one motor-drive milling machine, all for delivery at San Diego, Calif.

DAYTONA BEACH, FLA.—City has applied to PWA for loan of $350,000 for water works improvements. Francis Mills, city clerk. W. Austin Smith, engineer.

GRIFFIN, GA.—Batson-Cook Co. Inc., West Point, Ga., is reported to have contract for construction of a $70,000 mill unit, three stories high, and a detached machine shop one story high for the Highland Mills. Plans are being prepared by Robert & Co., Bona Allen building, Atlanta, engineers.

LEXINGTON, KY.—E. F. Pritchard, manager of Lexington branch of Bruckman Co., Cincinnati, O., is planning to install new equipment for brewery at plant on East Main street and to install three enamel underground storage tanks, mechanically refrigerated.

LOUISVILLE, KY.—C. P. Moorman & Co. Inc. is planning to improve and build an extension to its brewery, and to install additional equipment, at a cost of about $85,000.

LOUISVILLE, KY. — Louisville & Nashville has permit to repair its machine shop at 3025 South Floyd street, recently damaged by fire, at a cost of about $50,000.

LOUISVILLE, KY.—Kentucky Products Co. is planning to erect plants at Hobbs and Greenbrier, Ky., each including a power house, machine shop and other departments, at a cost of about

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BRAND
FERRO-ALLOYS

FERRO-SILICON
ALL GRADES
FERRO-CHROMIUM
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116 illustrations
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$100,000 each. D. X. Murphy & Bros., Louisville Trust building, are architects for Hobbs plant, and C. Walter Wagner, Louisville, is architect for Greenbrier distillery.

ALEXANDRIA, LA.—City has loan and grant of $250,000 for improvements to power plant and gas system, including boiler house with all modern equipment, such as water tube high pressure boilers and boiler feed pumps. I. W. Sylvester, city engineer.

GRETNA, LA.—Board of aldermen soon will call for bids for improvements and enlargement to water works. Plans have been prepared by Swanson-McGraw Inc., Balter building, New Orleans. Improvements will include filtration pump house building, pumping machinery and elevated tank and tower.

BALTIMORE—Croft Brewing Co. has acquired plant of Bismarck Brewery Co., Patterson avenue and Gay street, including machinery and equipment.

CENTREVILLE, MD.—Town commissioners received low bid at $31,460 for construction of sewer system and sewage treatment plant. Albright & Friel, 246 South Fifteenth street, Philadelphia, are engineers.

LAUREL, MD. — Prince George's Brewing Co., Harry A. Seay, president, Union Trust building, Washington, has awarded contract to J. Henry Miller Inc., Eutaw and Franklin streets, Baltimore, for construction of a brewery here to cost approximately $500,000, including equipment. Leon Chatelain Jr., 726 Jackson place, Washington, architect, and James Posey, Baltimore Trust building, Baltimore, mechanical consulting engineer, are preparing plans and specifications.

JACKSON, MISS.—Charles Karst Sr., 941 Royal, New Orleans, is interested in constructing a plant to be operated by Magnolia Brewing Co., Jackson, to cost about $400,000.

QUITMAN, MISS.—City has loan and grant of $30,000 for water works.

LOWELL, N. C.—Town has been allotted $47,000 for improvement to water works, erection of 50,000-gallon elevated steel tank, extension of distribution system and installation of fire hydrants.

ROCK HILL, S. C.—City has applied for loan of $529,000 for erecting power plant with 4000 kilowatt capacity.

SAVANNAH, TENN.—City has applied for PWA loan of $125,000 for construction of complete water works and sewage system and probably a filtration plant. Bob Guinn, mayor. Major Thomas H. Allen, state PWA engineer.

ABINGDON, VA.—Washington county sanitary district has made application for loan and grant of $490,000 for water works system.

KEYSVILLE, VA.—Town has applied for loan and grant of $69,000 for water works and sanitary sewer system.

MADISON HEIGHTS, VA.—Madison Heights sanitary district has applied for loan and grant of $83,500 for water works system.

MARION, VA.—Town has made application for loan of $221,000 for construction of steam electric plant and distribution system.

Missouri

KANSAS CITY, MO.—M. K. Goetz Brewing Co., St. Joseph, has acquired site for brewery with an annual capacity of 100,000 barrels, costing about $550,000.

ST. LOUIS—Monarch Metal Weatherstrip Co. is building a $40,000 plant. John Hill Construction Co., St. Louis, is general contractor.

Oklahoma

PONCA CITY, OKLA.—City has loan of $560,000 for water works project on Turkey Creek, and is planning to vote on bonds.

Texas

CLEBURNE, TEX.—City has been allotted $35,000 for construction of water works.

GALVESTON, TEX. — Galveston Brewing Co. is planning improvements to its properties and plant at Thirty-third and F streets, to cost about $200,000.

Minnesota

COLD SPRING, MINN.—Gold Spring Brewing Co., Ferdinand Peters president, will install a boiler plant and electrical power equipment in extensions it plans for its brewery, to cost $85,000. L. C. Pinault, Granite Exchange building, St. Cloud, Minn., is architect.

MINNEAPOLIS—Kelley Breweries & Distilleries Inc., 1923 Nicolette avenue, Room 203, P. J. Kelley president, plans to install boilers and accessories, refrigerating machinery, motors and electrical equipment among improvements to its plant at Fourteenth avenue, south, and Second street. The addition is 150 x 150 feet and total improvement will cost $300,000.

North Dakota

FAIRMOUNT, N. DAK.—Minneapolis, St. Paul & Sault Ste. Marie, E. A. Whitman, chief engineer, Soo Line building, Minneapolis, plans a roundhouse and shops here, to cost $100,000.

Colorado

ASPEN, COLO—Roaring Fork Light & Power Co., Aspen, Colo., plans construction of a transmission line to the Taylor river conservation dam and a power substation, to cost $100,000. Engineering department of the company is in charge.

Idaho

TWIN FALLS, IDAHO—Southern Idaho Brewers Inc. plans to build a brewery here with capacity of 60 barrels per day, costing $150,000.

Pacific Coast

LOS ANGELES—Continental Can Co., 3820 Union Pacific avenue, is having plans made for an addition, 174 x 200 feet, two stories.

LOS ANGELES—Pacific Iron & Metal Corp. has been incorporated by Joe Ratner, Louis M. Smith and Frieda Smith. Theo. Gottsdanker is attorney.

LOS ANGELES—E. Donald Marr has been granted a permit for construction of an oil refinery at Avalon boulevard and 223rd street to cost $200,000.

LOS ANGELES—Firestone Tire & Rubber Co. is building an addition to its plant at Twelfth and Figueroa streets here to cost $150,000, including new equipment.

LOS ANGELES—A new plant, costing about $250,000, to be known as Luminous Structures Inc., will be constructed at 6818 Avalon boulevard. This plant will contain over 100,000 square feet of floor space, will house something like $100,000 worth of machinery, and will employ about 200 men. Edward G. Neale and Thomas N. Neale are the executives.

HUNTINGTON PARK, CALIF.—Ernest H. Adams, 2068 Belgrave avenue, has plans for a plant to reclaim pipe and do manufacturing, on East Slauson avenue, 80 x 300 feet, on which bids will be asked soon.

SAN FRANCISCO — Milwaukee Brewing Co., 490 Tenth street, is building a brewery plant to cost about $250,000.

SAN FRANCISCO—Hunt-Mirk & Co., engineers, 141 Second street, represent interests which plan to erect a distillery in the Sacramento valley district, to cost about $60,000.

SEATTLE, WASH.—Resilent Hammer Inc. has been organized by Robert P. Martin and associates, 503 Smith Tower, to deal in and manufacture machinery.

Dominion of Canada

CORNWALL, ONT.—Canadian Industries Ltd., Montreal, will build a plant here on 28-acre site, for the manufacture of chlorine and caustic soda, to cost $900,000. Robert Salmon is general manager.

HAMILTON, ONT.—Dominion Foundries & Steel Ltd. is having plans drawn for an 82 x 122-foot building at Ottawa street and Beach road for a furnace building for its plate mill, to cost about $60,000. Prach & Prach, Hamilton, Ont., are architects.

TORONTO, ONT.—Dominion Diesel Ltd. has been incorporated to manufacture diesel engines and diesel-motored trucks, aircraft and boats. Factory space has been leased at 26-28 Cumberland street.

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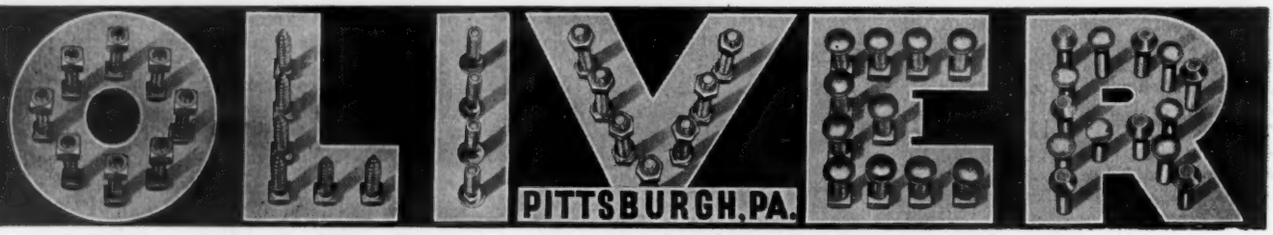

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